

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

MICROSOFT CORPORATION,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 07-090 (SLR)
	)	
ALCATEL-LUCENT ENTERPRISE and	)	<b>REDACTED -</b>
GENESYS TELECOMMUNICATIONS	)	<b>PUBLIC VERSION</b>
LABORATORIES, INC.,	)	
	)	
Defendants.	)	

**DEFENDANT ALCATEL LUCENT ENTERPRISE'S REPLY BRIEF IN SUPPORT OF  
ITS MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT AND  
INVALIDITY OF ALL ASSERTED CLAIMS OF UNITED STATES PATENT NOS.  
6,263,064 AND 6,728,357**

MORRIS, NICHOLS, ARSHT & TUNNELL LLP  
Jack B. Blumenfeld (#1014)  
Maryellen Noreika (#3208)  
1201 North Market Street  
P.O. Box 1347  
Wilmington, DE 19899  
(302) 658-9200  
jblumenfeld@mnat.com  
mnoreika@mnat.com

*Attorneys for Defendants  
Alcatel-Lucent Enterprise and  
Genesys Telecommunications Laboratories, Inc.*

*Of Counsel:*  
Steven C. Cherny  
LATHAM & WATKINS LLP  
885 Third Avenue, Suite 1000  
New York, NY 10022-4834  
(212) 906-1200

David A. Nelson  
LATHAM & WATKINS LLP  
Sears Tower, Suite 5800  
233 South Wacker Drive  
Chicago, IL 60606  
(312) 876-7700

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## INTRODUCTION AND SUMMARY OF ARGUMENT

Microsoft asserted that ALE infringes the 6,263,064 Patent (“the ’064 Patent”) and 6,728,357 Patent (“the ’357 Patent”) (collectively, “the O’Neal Patents”) in International Trade Commission (“ITC”) proceedings. On January 28, 2008, the Administrative Law Judge (ALJ) issued his final determination that the accused ALE products do not infringe the ’064 and ’357 Patents because the OXE system does not meet the single graphical menu limitation required by all the asserted claims of the O’Neal patents. The Commission adopted this finding of the ALJ on March 14, 2008. (Ex. 1 (Notice of Commission Decision To Review-In-Part A Final Initial Determination Finding A Violation Of Section 337) at 2.) Microsoft now seeks to avoid summary judgment of non-infringement and invalidity by asserting new and inconsistent arguments in an attempt to manufacture issues of fact where none exist. Simply put, Microsoft’s “strongest” arguments failed in the ITC and now Microsoft advances new second tier arguments in an attempt to stave off summary judgment.

*First*, in direct contradiction to the position it took and the admissions it made in the ITC proceedings, Microsoft now argues that the use of multiple menus accessed by the user in a hierarchical fashion is covered by the asserted claims. This argument renders the explicit requirement *for a single graphical menu* a complete nullity and runs contrary to the prosecution history.

*Second*, Microsoft’s argument that providing only some of the options via the telephony server meets the telephony server limitation is inconsistent with the plain language of the claims and is an improper application of the doctrine of equivalents.

*Third*, Microsoft’s construction of the Unified Messaging System limitation (that messages be received, stored, retrieved, and forwarded “in a coordinated manner”) requires that the OXE system be able to perpetually store messages or retrieve them from any device, yet

Microsoft is unable to provide any support for its contention that the OXE system possesses these capabilities.

**Fourth**, Microsoft cannot meet its burden of proving indirect infringement because Microsoft has accused the combined Alcatel OmniPCX Enterprise (OXE) Switch and OTUC software suite of infringement, and the OXE Switch, as admitted by Microsoft, has substantial non-infringing uses.

**Fifth**, Microsoft fails to raise any issues of material fact that would preserve the validity of the O'Neal Patents under Microsoft's constructions of the disputed claim terms.

For these reasons and as further discussed below, ALE requests that the Court grant summary judgment on the issues of non-infringement and invalidity of the O'Neal Patents.

## ARGUMENT

### A. The OXE System Does Not Have a Single Graphical Menu That Displays All Options For All Of A Subscriber's Services

#### 1. Microsoft admitted that the OXE system does not infringe under ALE's Construction

Only last year, Microsoft admitted in the ITC that under ALE's construction of the single graphical menu limitation, there is *no* infringement. (*See, e.g.*, Ex. 2 (Beckmann Dep.) at 91:25-92:16; Ex. 3 (Chang ITC Hrg. Tr.) at 746:22-747:3, 850:25-851:13, 856:12-857:8, 857:9-858:3; Ex. 4 (ITC Initial Determination) at 188; Ex. 5 (Commission's Opinion) at 1, 7.) However, now that the ITC has adopted ALE's proposed construction of the single graphical menu limitation and found non-infringement, Microsoft has done an about-face and now argues that there *is* infringement under ALE's construction. Microsoft's contradictory arguments of convenience cannot raise a material question of fact. *See Sinskey v. Pharmacia Ophthalmics, Inc.*, 982 F.2d 494, 498 (Fed. Cir. 1992) (Patentee was unable to create an issue of fact sufficient to avoid summary judgment because he could not provide a satisfactory explanation for discrepancies

between his declaration and previous deposition statements.))

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (Ex. 6 (Microsoft Post-Hearing ITC Brief)

at 104 (emphasis added).)

[REDACTED]

[REDACTED]

[REDACTED]

The ALJ's Initial Determination also acknowledged Microsoft's concession that

ALE did not infringe:

[REDACTED]

[REDACTED] In fact, complainant's infringement arguments depend on its claim construction argument.

[REDACTED]

Thus, complainant not only provided no argument that the accused products infringe under a different claim construction, but also admitted that several graphical menus are generated.

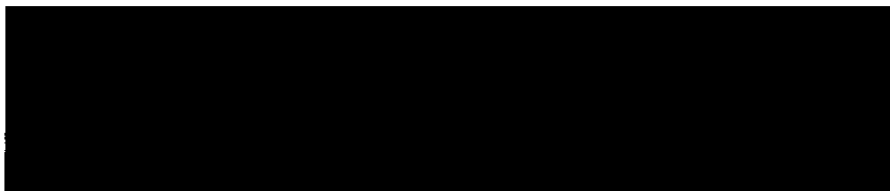
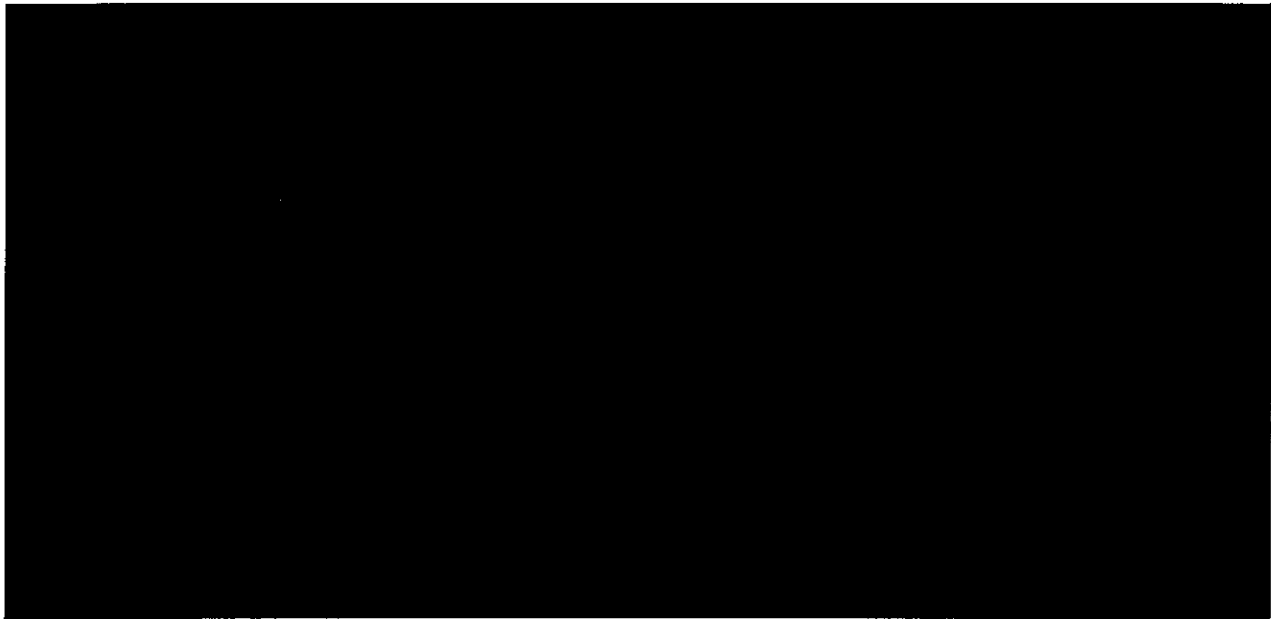
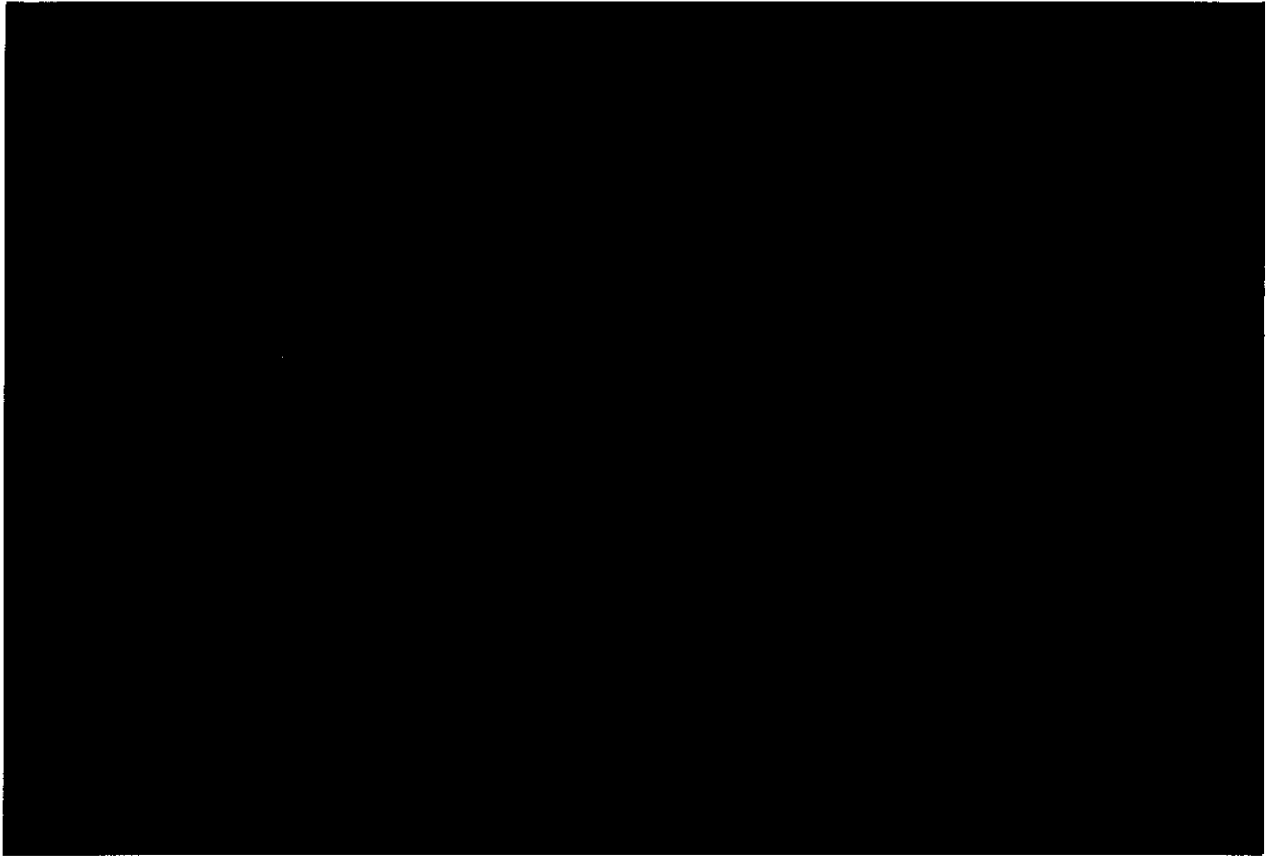
(Ex. 4 (ITC Initial Determination) at 188 (internal citations omitted) (emphasis added).)

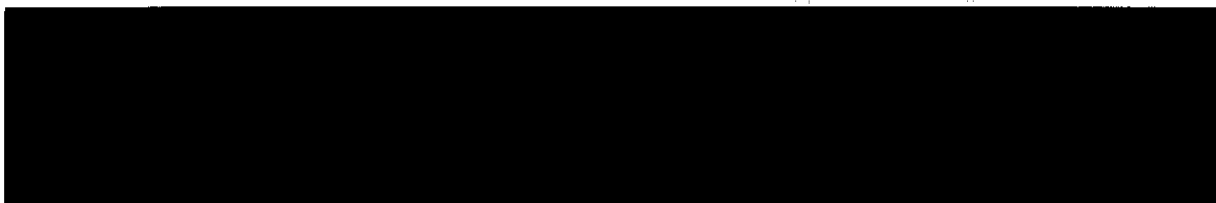
The ALJ's Initial Determination on this point was adopted by the Commission. (Ex. 5 (Commission's Opinion) at 1, 7 (declining to review the ALJ's decision with respect to the O'Neal Patents, and "adopt[ing] the ALJ's findings that are not inconsistent with [the Commission's] opinion.").)

In order to try to save its infringement case, Microsoft now argues that ALE infringes under ALE's construction of the single graphical menu limitation. [REDACTED]

[REDACTED]







Microsoft attempts to create an issue of material fact where it had steadfastly admitted there was none.

2.



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<sup>1</sup> Microsoft's portrayal of Dr. Beckmann's "discovery" as a recent one is implausible given that Microsoft's attorneys purchased an accused system more than a year ago. (See Alcatel Business Systems' Opening Brief In Support Of Its Motion To Disqualify Counsel, For Exclusion Of Evidence And For Other Sanctions) (D.I. 31) at 6-7.)

[REDACTED]

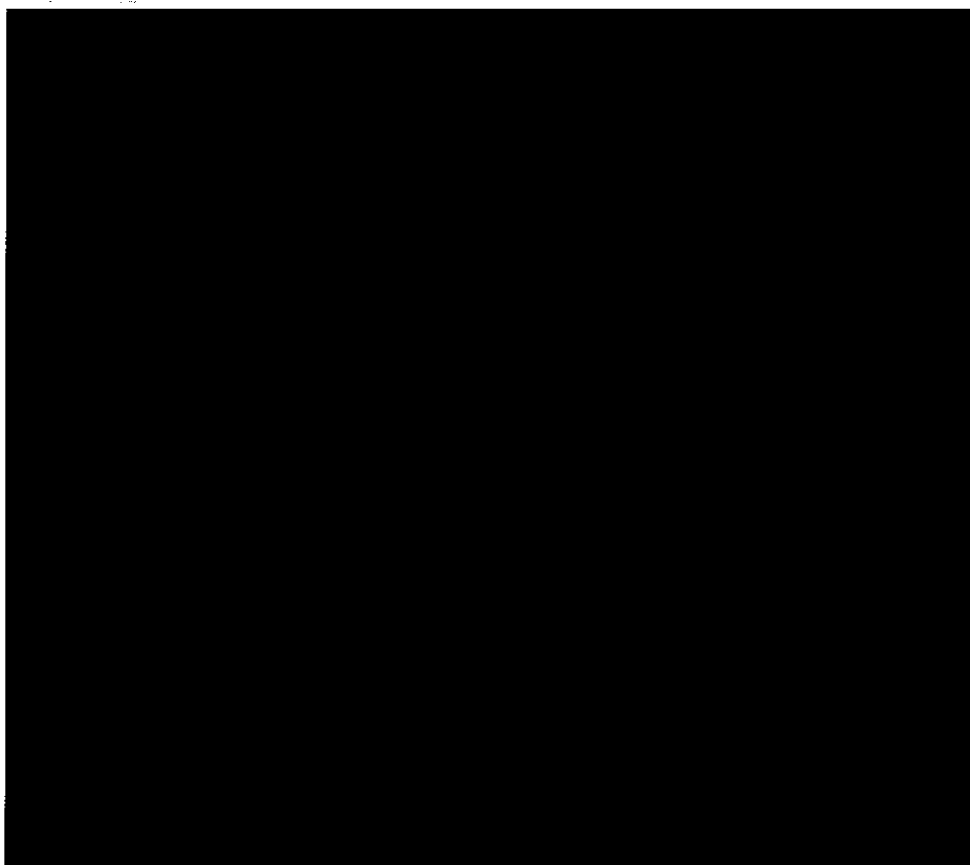
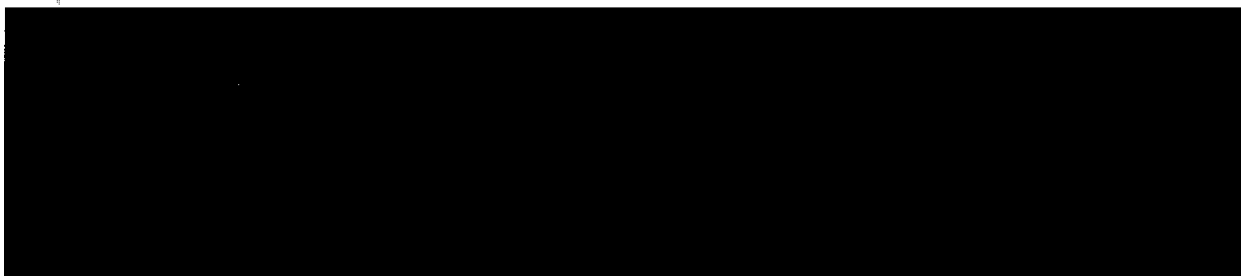
[REDACTED]

[REDACTED]

[REDACTED]

This argument fails to satisfy Microsoft's burden "to show an evidentiary conflict as to the material fact in dispute." *See Opryland USA Inc. v. Great American Music Show, Inc.*, 970 F.2d 847, 850 (Fed. Cir. 1992) ("[T]o defeat the motion [for summary judgment] the non-movant must present sufficient evidence to show an evidentiary conflict as to the material fact in

dispute.”). The claims require a single graphical menu, not the capability to see all menus simultaneously on a large enough screen.



(D.I. 187 (Microsoft '064 and '357 Brief) at 10-11 (emphasis added).) Microsoft apparently still views the ALE products as only capable of generating multiple menus to display the communication options.

**3. Microsoft's new arguments are directly contradicted by the '064 Patent prosecution history**



[REDACTED]

[REDACTED] In prosecuting the '064 Patent, the patentee argued that the single graphical menu was an improvement over Pepe because "by providing a single graphical menu, a user may *quickly and conveniently* review the communication options and make changes thereto." (Ex. 7 ('064 Patent Prosecution History) at MSAL 1001 (emphasis added).) [REDACTED]

[REDACTED]

Rather than being "quick" and "convenient," Screenshot 4 instead represents the cumbersome technology that the patentee sought to overcome by amending the claims to include the single graphical menu limitation. *See Biagro W. Sales, Inc. v. Grow More, Inc.*, 423 F.3d 1296, 1305 (Fed. Cir. 2005) ("If the narrowing amendment was the addition of a new claim limitation, as in the case before us, equivalents are presumptively not available with respect to that limitation."); Ex. 7 ('064 Patent Prosecution History) at MSAL 1001-02. [REDACTED]

[REDACTED]

**B. The OXE System Cannot Infringe Under The Doctrine Of Equivalents**

**1. Microsoft is precluded from arguing for infringement under the doctrine of equivalents because of prosecution history estoppel**

In an effort to circumvent prosecution history estoppel, Microsoft argues that the patentee added the single graphical menu limitation based on a rationale that “[bore] no more than a tangential relation” to the display of multiple windows on a computer screen. The gravamen of Microsoft’s argument is that the patentee added the single graphical menu limitation to overcome Pepe’s failure to display all of the communication options on a single computer *screen*. (See D.I. 187 (Microsoft ’064 and ’357 Brief) at 27.) That is not the case. The prosecution history demonstrates clearly that the patentee added the single graphical menu limitation to overcome Pepe’s failure to display all of the communication options on a single *menu*.

Microsoft ignores the language in the prosecution history explicitly revealing the hurdle created by Pepe, which the single menu limitation overcame: “it is respectfully submitted that a single graphical **menu** containing the communication options is neither disclosed nor reasonably suggested by Pepe et al.” (See Ex. 7 (’064 Patent Prosecution History) at MSAL 1002 (emphasis added).) The text cited by Microsoft discussing “multiple screens” served only to demonstrate why multiple menus were cumbersome, and why a single menu was an alleged improvement over Pepe. Microsoft distorts the prosecution history by implying that the number of display *screens* was the impetus for the single graphical menu limitation, when in reality, the concern was the number of *menus*. (See *id.* at 1001-02.)

Because the central reason for including the single graphical menu limitation was to overcome Pepe’s multiple menus, Microsoft cannot now argue that the number of windows is

merely “tangential” to the reason for the amendment. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 740-1 (2002). The number and nature of the windows displayed is directly relevant to whether there is one or multiple menus. Where each window constitutes its own menu, a graphical interface comprised of multiple menus would not be covered by the single graphical menu limitation of the ’064 Patent. (See Section II.A.2, *infra* (demonstrating that each OTUC window is, itself, graphical menu).)

Because the patentee disclaimed more than “a single graphical menu containing the communication options” during the prosecution of the O’Neal Patents, Microsoft cannot recapture that disavowed claim scope through equivalents to cover systems that have multiple graphical menus to display the communication options. Such “equivalents are presumptively not available with respect to that limitation.” *See Biagro*, 423 F.3d at 1305.

2. [REDACTED]

[REDACTED]

[REDACTED] (See D.I. 187 (Microsoft ’064 and ’357 Brief) at 24-25.) This is not only contrary to the prosecution history, but also defies common sense.

[REDACTED]

[REDACTED] If that were the case, then a user’s email program, word processing program and spreadsheet program would all necessarily be regarded as a single menu as long as they were all visible on a single computer screen. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (See Declaration of Henry Hyde-Thomson In Support Of Defendants' Motions For Summary Judgment And Invalidity Of All Asserted Claims Of U.S. Patent Nos. 6,263,064, 6,728,357, 6,430,289 ("Hyde-Thomson Decl.") (D.I. 161) at 8, ¶ 33.)

[REDACTED]

*See Stumbo v. Eastman Outdoors, Inc.*, 508 F.3d 1358, 1364 (Fed. Cir. 2007) ("A finding of infringement under the doctrine of equivalents requires a showing that the difference between the claimed invention and the accused product was insubstantial. One way of doing so is by showing on a limitation by limitation basis that the accused product performs substantially the same function in substantially the same way with substantially the same result as each claim limitation of the patented product.").

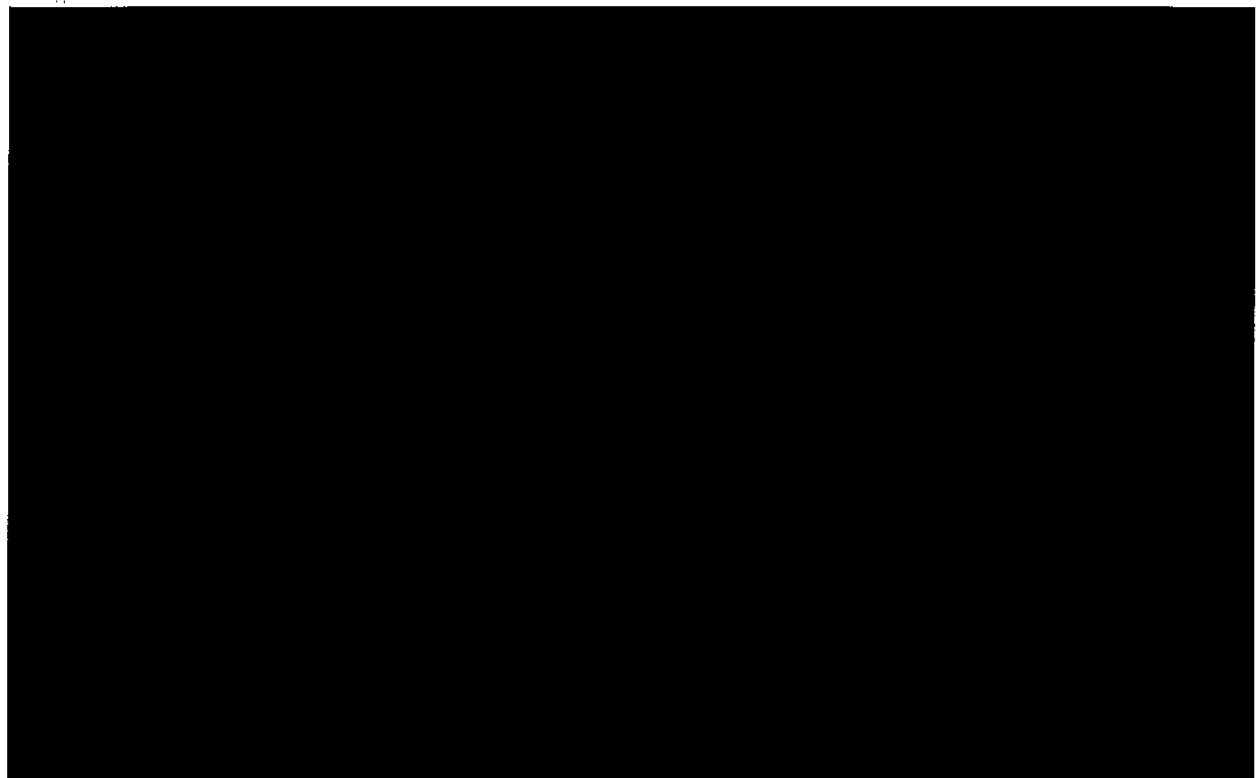
[REDACTED]

[REDACTED]





(See D.I. 187 (Microsoft '064 and '357 Brief) at 12-13.)



Accordingly, the result would not perform substantially the function in substantially the same way with substantially the same result as the single graphical menu claimed by the O'Neal Patents.

**C. The Accused OXE System Does Not Infringe Under ALE's Construction of the Telephony Server Limitation**

- 1. ALE does not literally infringe as even Microsoft admits that the telephony server does not represent the same communication options that are available through the single graphical menu**

ALE's construction of the telephony server limitation is: "a telephony server that represents *the same* communication options that are available through the single graphical menu." (See Opening Claim Construction Brief Of Defendants Alcatel-Lucent Enterprise And Genesys ("ALE's Markman Brief") (D. I. 162) (emphasis added).) Microsoft claims that OXE infringes the O'Neal Patents under ALE's construction of the telephone limitation. It offers only evidence to the contrary, however.

Under ALE's construction the telephone server must represent *the same* options as are displayed via the single graphical menu. If any fewer are represented then there can be no infringement under ALE's definition. Incredibly, Microsoft only offers arguments of precisely this scenario: a telephony server representing fewer options than are displayed via the graphical menu. (See D.I. 187 (Microsoft '064 and '357 Brief) at 29.)

Microsoft claims that "[t]he accused OXE System meets the telephone server limitation based on the explicit language of ALE's construction." [REDACTED]

[REDACTED]

[REDACTED] (See *id.*) It is obvious, and needs no further explanation, that "several" and "many" communication options do not amount to "the same" communication options.



[REDACTED] (See Ex. 9 (OmniTouch Unified Communication) at ABS00009629.)



[REDACTED] Accordingly, the OXE system cannot literally infringe under ALE's construction of the telephone limitation.

**2. ALE does not infringe by the doctrine of equivalents**

Microsoft contends that ALE infringes under the doctrine of equivalents because “providing audible access to a substantial number of the communication options” is substantially the same function as “audibly represent[ing] all communication options. (See D.I. 187 (Microsoft '064 and '357 Brief) at 31.). Microsoft's assertion disproves itself; as stated in ALE's Opening Brief, there is a substantial difference between having the same communication options available and merely having only some of the communication options available. (Defendant Alcatel Lucent Enterprise's Opening Brief In Support Of Its motion For Summary Judgment Of Non-Infringement And Invalidity Of All Asserted Claims Of U.S. Patent Nos. 6,263,064 and 6,728,357 (“ALE '064 and '357 Brief”) (D.I. 158) at 12-13.) If Microsoft's position were given credence, it would “vitate [one of] the central functions of the patent claims

themselves,” i.e., that the same communication options represented by the telephony server must also be represented by the graphical menu. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29-30 (1997) (concluding that when applied correctly, “the doctrine [of equivalents] will not vitiate the central functions of the patent claims themselves”); *Novartis Pharm. Corp. v. Abbott Lab.*, 375 F.3d 1328, 1336 (Fed. Cir. 2004) (affirming summary judgment of non-infringement because a patent that claimed a drug comprised of two compounds could not cover, by equivalents, a drug comprised of only one of the compounds since “part” ... means ‘something less than a whole’”). Accordingly, the OXE system cannot meet the O’Neal Patents’ telephony server limitation even under the doctrine of equivalents.

**D. The OXE System is Not a “Unified Messaging System” Under Microsoft’s Construction of the Term**

[REDACTED]

[REDACTED] (See D.I. 187 (Microsoft ’064 and ’357 Brief) at 31.) Microsoft’s construction requires that the OXE system additionally be able to persistently store messages and to retrieve any type of message from any device. [REDACTED] (See D.I. 161 (Hyde-Thomson Decl.) at 10, ¶ 41.) [REDACTED]

[REDACTED]

[REDACTED] (See D.I. 187 (Microsoft ’064 and ’357 Brief) at 32.) Thus, the OXE system cannot be considered a unified messaging system, and cannot infringe the O’Neal Patents under Microsoft’s construction of a unified messaging system.

Accordingly, the literature cannot be construed as an admission. (See Ex. 10 (Alcatel OmniPCX Enterprise Unified Communication) at UPMC019271.)

Finally, Microsoft attempts to discredit ALE by maintaining that “ALE never disputed that the accused OXE System was a unified messaging system during the IC investigation.” (D.I. 187 (Microsoft ’064 and ’357 Brief) at 32.) Microsoft ignores the fact that it has proposed a different construction of “unified messaging system” in the instant case, thereby requiring ALE to analyze Microsoft’s infringement claims in light of its new claim construction:

Microsoft’s ITC Construction of “Unified Messaging System”	Microsoft’s Current Construction of “Unified Messaging System”
<p>“system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages”</p> <p>(Ex. 11 (ITC Order No. 18))</p>	<p>“system that allows messages of a data-centric network and telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages (i.e., in a coordinated manner)”</p> <p>(D.I. 187 (Microsoft ’064 and ’357 Brief) at 13.)</p>

#### **E. Microsoft Has Failed To Satisfy Its Burden On Indirect Infringement**

Microsoft has failed to satisfy its burden on indirect infringement. Microsoft does not allege that the Omni PCX Enterprise Switch (OXE), sold alone, infringes the O’Neal Patents. ■

(See Ex. 12 (EMEA Unified Messaging And Communication Markets) at

MSAL 5020233. *See also*, Ex. 13 (Telephony Advisor for Exchange Server) at ABS 01257454; Ex. 14 (Leroy ITC Hrg. Tr.) at 1118:6-13; Ex. 15 (Serafin ITC Hrg. Tr.) at 320:12-321:9, 335:23-336:9.) [REDACTED]

[REDACTED] (See Ex. 14 (Leroy ITC Hrg. Tr.) at 1088:23-1089:7, 1118:6-13; Ex. 16 (OmniPCX Summary Specifications) at ABS 00004938-53; Ex. 17 (OmniPCX Enterprise Overview) at ABS 00017361-74.) There can be no contributory or inducement infringement where the relevant product is capable of substantial non-infringing uses. *See Dawson Chemical Co. v. Rohm & Haas Co.*, 448 U.S. 176, 199-200 (1980) (Unless a staple “has no use except through practice of the patented method,” the patent owner has no right to claim that its distribution constitutes contributory infringement.). Accordingly, it is clear that the OXE Switch, sold alone, does not infringe the O’Neal Patents.

ALE further incorporates by reference Section A.4 in Defendant Alcatel Lucent Enterprise’s Reply Brief In Support Of Its Motion For Summary Judgment Of Non-Infringement And Invalidity Of All Asserted Claims Of United States Patent No. 6,421,439.

**F. The O’Neal Patents are Invalid Under Microsoft’s Proposed Constructions**

**1. The O’Neal Patents are Anticipated by the Swartz Patent**

Microsoft argues that Swartz cannot function as a unified messaging system under Microsoft’s construction of the term because “Swartz does not receive, store, retrieve and forward messages in a coordinated manner.” (D.I. 187 (Microsoft ’064 and ’357 Brief) at 34.) In fact, Swartz explicitly describes its ability to act as a unified messaging system despite its use of a POP email server:



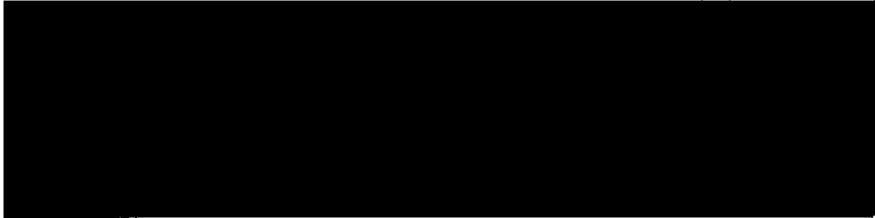
“The subscriber may *control the manner in which Email, voicemail and fax transmissions are handled* using the form seen in FIG. 8. To effect email handling, *the host services computer operates as a POP mailbox* and SMTP server for receiving and

sending email respectively. In order to *coordinate email, voicemail and fax transmission*, the host services computer may advantageously employ a set of conventional format conversion functions

(Ex. 18 (Swartz Patent) at 12:18-25 (emphasis added).)

Microsoft further overlooks the explicit language of Swartz in its criticisms that “there is no disclosure of any additional software used with the Swartz POP server in order to implement ... coordination.” (D.I. 187 (Microsoft ’064 and ’357 Brief) at 34.) Swartz explicitly notes that “format conversion functions” (i.e., computer programs), may be used by the host computer to “coordinate email, voicemail and fax transmission.” (Ex. 18 (Swartz Patent) at 12:22-25.)

Given Swartz’s explicit statements demonstrating its ability to function as a unified messaging system, it strains credulity for Microsoft to claim that “it was commonly known at the time of the invention that POP systems were incompatible with unified messaging systems.” (D.I. 187 (Microsoft ’064 and ’357 Brief) at 34.)

(See D.I. 158 (ALE ’064 and ’357 Brief) at 23; Ex. 8 (Hyde-Thomson ITC Hrg. Tr.) at 1283:6-1284:11.) Accordingly, Microsoft’s arguments cannot create an issue of material fact necessary to overcome ALE’s motion for summary judgment. *See Sinskey*, 982 F.2d at 498 (“To allow [a party] to preclude summary judgment simply by contradicting his own prior statements would seriously impair the utility of Federal Rule of Civil Procedure 56.”).

## 2. The O'Neal Patents are Anticipated by the Nagai Patent

Microsoft rehashes its previous arguments that Nagai is not a unified messaging system despite explicitly claiming to be just that. Nagai discloses "in FIG. 2, a groupware server 203 for providing a *unified messaging service for unified messaging of voice, text and facsimile mail.*" (Ex. 19 (Nagai Patent) at 7:62-64.) [REDACTED]

[REDACTED] (Ex. 8 (Hyde-Thomson ITC Hrg. Tr.) at 1321:17-1327:6.) Microsoft's protestations to the contrary are simply unfounded. [REDACTED]

[REDACTED] (See *id.* at 1033:9-25, 1526:20-1531:7; D.I. 187 (Microsoft '064 and '357 Brief) at 35.)

Microsoft finally argues that ALE has never identified the portions of Nagai that disclose the limitations of Claim 8 of the '064 Patent. (*Id.* at 36-37.) As stated in ALE's Opening Brief, however, Microsoft's argument is based only the application of ALE's proposed construction of the single menu limitation. When Microsoft's proposed construction is applied, Nagai anticipates Claim 8 of the '064 Patent. (See *id.* at 24, fn6.)

## CONCLUSION

For the foregoing reasons, ALE respectfully requests that the Court grant ALE's motion for summary judgment on the issue of non-infringement and invalidity of the O'Neal patents.



MORRIS, NICHOLS, ARSHT & TUNNELL LLP



Jack B. Blumenfeld (#1014)

Maryellen Noreika (#3208)

1201 North Market Street

P.O. Box 1347

Wilmington, DE 19899

(302) 658-9200

jblumenfeld@mnat.com

mnoreika@mnat.com

*Attorneys for Defendants Alcatel-Lucent Enterprise  
and Genesys Telecommunications Laboratories,  
Inc.*

*Of Counsel:*

Steven C. Cherny

LATHAM & WATKINS LLP

885 Third Avenue, Suite 1000

New York, NY 10022-4834

(212) 906-1200

David A. Nelson

LATHAM & WATKINS LLP

Sears Tower, Suite 5800

233 South Wacker Drive

Chicago, IL 60606

(312) 876-7700

June 30, 2008

2389663

**CERTIFICATE OF SERVICE**

I, Maryellen Noreika, hereby certify that on July 7, 2008 I electronically filed the foregoing document, which will send notification of such filing(s) to the following:

Thomas L. Halkowski, Esquire  
FISH & RICHARDSON P.C.

I also certify that copies were caused to be served on July 7, 2008 upon the following in the manner indicated:

**BY ELECTRONIC MAIL  
and HAND DELIVERY**

Thomas L. Halkowski, Esquire  
FISH & RICHARDSON P.C..  
919 N. Market Street  
Suite 1100  
Wilmington, DE 19801

**BY ELECTRONIC MAIL**

Ruffin B. Cordell, Esquire  
Linda Liu Kordziel, Esquire  
FISH & RICHARDSON P.C.  
1425 K. Street, N.W.  
11<sup>th</sup> Floor  
Washington, DC 20005

John E. Gartman, Esquire  
FISH & RICHARDSON P.C.  
12390 EL Camino Real  
San Diego, CA 92130

*/s/ Maryellen Noreika*

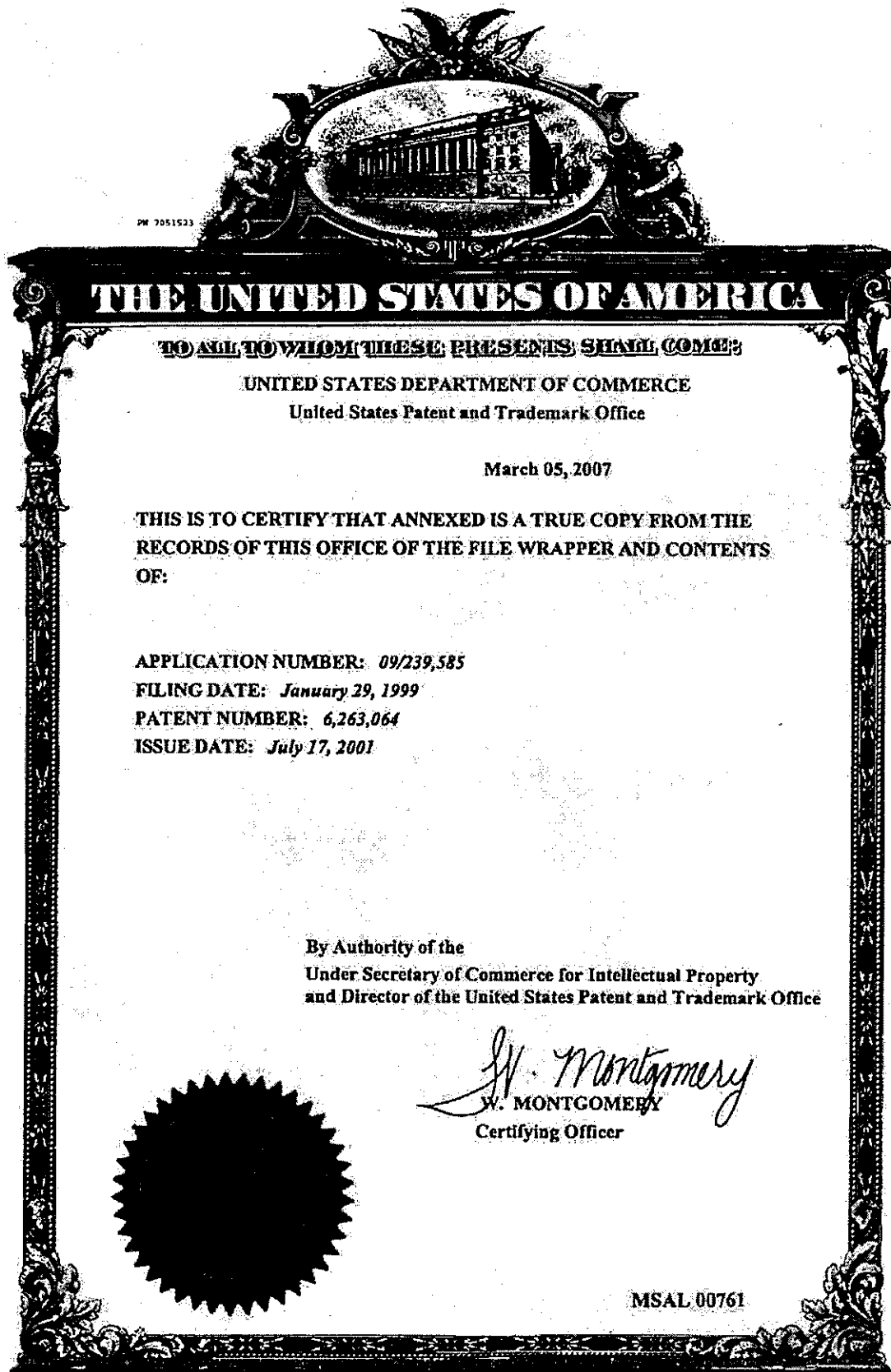
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Maryellen Noreika (#3208)

**EXHIBITS 1 – 6**

**REDACTED IN THEIR  
ENTIRETY**

# EXHIBIT 7



Three listings are included in the method: 1) associating a telephone number to a tag, 2) storing tags in a quick sequence and 3) activating a quick response (Col 3-5). The listings show the portion of interaction after the subscriber places a call to an 800-type telephone number to connect to the automated attendant and after he/she has successfully completed any login procedures to begin administering his/her personal telephone number. In the third listing, Feit states, "To turn a quick sequence or quick follow me destination on or off, press 2 (Col. 5, lines 30-31)."

Bissel discloses a method of forwarding telecommunication calls to individuals when they are away from their normal location. More particularly, a telecommunication subscriber who is traveling away from his or her home or office can have calls forwarded to a different location that is determined automatically when the subscriber engages in a transaction or activity that indicates his/her location. The transaction or activity can be any action that causes an electronic database to be updated with information that directly or indirectly is indicative of the subscriber's whereabouts, either specific or general. It is not necessary for the subscriber for the subscriber to remember to specifically to update his/her database record.

#### Claims 1-9 and 20-30

In contrast to Pepe, independent claims 1 and 20 of the present application require a **single graphical menu** that is arranged to display the communication options for each of the communication services **at the same time**. That is, the communication options for each of the communication services are simultaneously displayed on a computer terminal when the subscriber employs the display terminal to access the computer-implemented control center through a data-centric network. In essence, the graphical menu serves as a centralized visual interface or control panel for reviewing and/or customizing the communication options associated with various communication services. As should be appreciated, by providing a single graphical menu, a user may quickly and conveniently review the communication options and make changes thereto. Claims 1 and 20 have been amended to better clarify this aspect of the invention.

While Pepe may disclose the use of control options and subscriber profiles, Pepe does not contemplate a single graphical menu where only one view is used to display the communication options. Rather, in Pepe, the subscriber must go through a plurality of views independently,

wherein the options are displayed at different times (See, Col. 34, Line 10 – Col. 36, Line 51 and Figures 28-45). In order to access all of the screens in Pepe, a subscriber must traverse through at least 18 screens as shown in Figures 28-45. In contrast, the present invention does not have to access multiple screens to modify options. In fact, the communication options, which are displayed on a single screen, may be modified as needed with a few keystrokes. Accordingly, it is respectfully submitted that a single graphical menu containing the communication options is neither disclosed nor reasonably suggested by Pepe et al. Furthermore, claim 20 of the present invention, as amended, additionally requires that the communication options be visually presented on a display terminal via **an individualized web page** associated with the subscriber. As should be appreciated by the Examiner, Pepe is silent to subscriber web pages.

With respect to the secondary references, it is respectfully submitted that the addition of Feit and Bissel to the Pepe patent does not cure the deficiencies of the Pepe et al. patent discussed above. It is the applicant's understanding that each of the cited references completely fails to suggest visually displaying a single graphical menu.

Therefore, for at least the reasons above, it is respectfully submitted that the art of record neither discloses nor reasonably suggests the invention as currently recited in claims 1 and 20. Accordingly, it is respectfully submitted that claims 1 and 20, as amended, are patentable over the art of record.

Claims 2-9, and 21-22 (as well as new claims 23-30) each depend either directly or indirectly from claims 1 and 20 and are therefore respectfully submitted to be patentable over the art of record for least the reasons set forth above. They also require additional elements that when considered in light of the claimed combination further patentably distinguish the present invention.

For example, claim 6 of the present invention, discloses a follow-me service, a follow me service enable option, and a set of numbers. The follow-me service enable option when enabled by the subscriber, permits "a caller" (not a subscriber) to elect to forward a call to a telephone associated with the set of telephone numbers. The follow me service gives the subscriber the ability to designate a set of telephone numbers where he/she may likely be found and gives the caller the option to try and find the subscriber (or someone who may appropriately handle the incoming call) at those numbers. From the caller's perspective, the follow me service is an on-

**EXHIBITS 8-10**

**REDACTED IN THEIR  
ENTIRETY**



# EXHIBIT 11

UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

In the Matter of )

CERTAIN UNIFIED COMMUNICATIONS )  
SYSTEMS, PRODUCTS USED WITH )  
SUCH SYSTEMS, AND COMPONENTS )  
THEREOF )

Investigation No. 337-TA-598

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US INTL TRADE COMM  
2007 OCT -5 PM 4: 24

Order No. 18: Initial Determination Terminating The Investigation As To  
Claims 3 and 48 Of The '439 Patent, Claims 3, 6, And 8-10  
Of The '289 Patent, Claim 9 Of The '064 Patent And Claim 4  
Of The '357 Patent

On October 4, 2007, the administrative law judge initiated a telephone conference with all parties participating.<sup>1</sup> It was represented at the telephone conference by the private parties that certain issue have been narrowed and it was indicated that a letter would be received by the administrative law judge on October 5, 2007 as to those issues.

As seen from the October 5, 2007 letter<sup>2</sup> complainant has withdrawn claims 3 and 48 of U.S. Patent No. 6,421,439 (the '439 Patent) in issue, claims 3, 6, and 8-10 of U.S. Patent No. 6,430,289 (the '289 Patent) in issue, claim 9 of U.S. Patent No. 6,263,064 (the '064 patent) in issue and claim 4 of U.S. Patent No. 6,728,357 (the '357 patent) in issue. Moreover, said letter indicates that all other parties have agreed to said withdrawal.<sup>3</sup>

<sup>1</sup> The evidentiary hearing in this investigation is set to commence on October 9, 2007.

<sup>2</sup> A copy of said letter is included with this order.

<sup>3</sup> The administrative law judge is treating the portion of the letter relating to withdrawal of claims as Motion No. 598-25 by complainant o terminate as to those claims. The claims in issue remaining are claims 1, 28 and 38 of the '439 patent, claims 1 and 7 of the '289 patent, claims 3, 8, 11, 12 and 20 of the '064 patent and claim 6 of the '357 patent.

A complainant can seek partial termination of an investigation by withdrawing asserted claims pursuant to rule 210.21(a)(1). Certain Tool Handles, Tool Holders, Tool Sets, Inv. No. 337-TA-483, Order No. 7 (April 22, 2003). Such partial termination will be granted in the absence of extraordinary circumstances. Id.; see also Certain Ultrafiltration Systems, Inv. No. 337-TA-107, Commission Action and Order at 2 (Mar. 11, 1982) (noting that “in the absence of extraordinary circumstances, termination of the investigation will be readily granted to a complainant during the prehearing stage of an investigation.”)

The record does not show any extraordinary circumstances exist that would prevent partial termination as to the withdrawal of the claims identified above. Moreover, withdrawal of said claims in issue would help streamline the investigation and would promote resolution of the remaining issues in this investigation.

Motion No. 598-25 is granted.

This initial determination, pursuant to Commission rule 210.42(c), is hereby CERTIFIED to the Commission. Pursuant to Commission rule 210.42(h)(3), this initial determination shall become the determination of the Commission within thirty (30) days after the date of service hereof unless the Commission grants a petition for review of this initial determination pursuant to Commission rule 210.43, or orders on its own motion a review of the initial determination or certain issues therein pursuant to Commission rule 210.44.

On October 5, 2007, each of the private parties and the staff received a copy of this order

A handwritten signature in black ink, appearing to read "Paul J. Luckern", written over a horizontal line.

Paul J. Luckern  
Administrative Law Judge

Issued: October 5, 2007

# FISH & RICHARDSON P.C.

Frederick P. Fish  
1855-1930

W.K. Richardson  
1859-1951

October 5, 2007

VIA E-MAIL AND HAND DELIVERY

The Honorable Paul J. Luckern  
United States International Trade Commission  
500 E Street, S.W.  
Washington, D.C. 20436

DOCKET NUMBER
598.025
Office of the Secretary Int'l Trade Commission

1425 K STREET, N.W.  
11TH FLOOR  
WASHINGTON, DC 20005

Telephone  
202 783-5070

Facsimile  
202 783-2331

Web Site  
www.fr.com

Re: Certain Unified Communication Systems, Products Used With Such Systems, and  
Components Thereof, Inv. No. 337-TA-598

Dear Judge Luckern:

In an effort to streamline the presentation of evidence in connection with certain  
issues to be addressed at the hearing in this Investigation, the parties (including the  
Investigative Commission Staff) have met and conferred and agreed to the following:

## Asserted Claims:

Complainant Microsoft Corporation will proceed to the hearing on the following  
claims:

'439 Patent - claims 1, 28, 38 (claims 3 and 48 are withdrawn);

'289 Patent - claims 1 and 7 (claims 3, 6, 8-10 are withdrawn);

'064 Patent - claims 3, 8, 11, 12 and 20 (claim 9 is withdrawn);

'357 Patent - claim 6 (claim 4 is withdrawn).

## Claim Constructions:

The parties agree to the following claim constructions proposed by the Commission  
Investigative Staff:

### '439 Patent

"telephone network" - "network for carrying telephony information"

"computer network" - "network for carrying digital data"



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WASHINGTON, DC

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2007 OCT -5 PM 1:53

FISH & RICHARDSON P.C.

Hon. Paul J. Luckern

October 5, 2007

Page 2

“current activity of the user on the computer network” – “current status of the user on the computer network”

“the controller accessing the user-selectable criteria in the one or more lists of the data structure via the computer network access port” – “hardware or software that accesses the user-selectable criteria in one or more lists of the data structure via the computer network access port and thereby applying the user-selectable criteria to the incoming call”

'289 Patent

“telephone network” – “network for carrying telephony information”

“computer network” – “network for carrying digital data”

'064 and '357 Patents

“communication options” – “parameters associated with specific types of communication services”

“unified messaging system” – “system that allows messages of a data-centric network and a telephony-centric network to be received, stored, retrieved, and forwarded without regard to the communication devices or networks employed for the transmission of the messages”

“telephony-centric network” – “a network that carries telephony information used by devices such as telephones, pagers, facsimile machines, and voice mail boxes”

“data-centric network” – “a network, that carries digital data, primarily to facilitate information exchange among computers and computer peripherals”

“e-mail service” – “a communication service for receiving, storing, retrieving, and forwarding e-mails”

“voice telephone service” – “a communication service for receiving, storing, retrieving, and forwarding telephony information”

Prior Art:

Respondent Alcatel Business Systems will proceed to the hearing on the following prior art references:

FISH & RICHARDSON P.C.

Hon. Paul J. Luckern

October 5, 2007

Page 3

'439 Patent

- U.S. Patent No. 6,041,114 to Chestnut (RX-1);
- U.S. Patent No. 5,652,789 to Miner (RX-3); and
- U.S. Patent Application Publication No. US 2003/0191676 to Templeton application (RX-189)

'289 Patent

- The Chestnut '114 patent (RX-1);
- U.S. Patent No. 6,480,593 to Munday (RX-187); and
- The Templeton Application (RX-189)

'064 and '357 Patents

- U.S. Patent No. 6,445,694 to Swartz (RX-5);
- U.S. Patent No. 6,636,587 to Nagai (RX-4);
- Literature describing the Octel Unified Messenger Product (RX-6, RX-7, RX-9, RX-10); and
- U.S. Patent No. 5,742,905 to Pepe (RX-8)

The parties have further agreed that the foregoing stipulations regarding the asserted claims, claim construction positions, and prior art references, will not limit or preclude any positions the parties may take in the parallel Delaware action.

Sincerely,

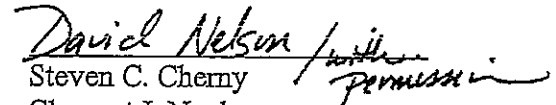
FISH & RICHARDSON P.C.

Hon. Paul J. Luckern  
October 5, 2007  
Page 4



Ruffin B. Cordell  
Linda L. Kordziel  
Joseph V. Colaianni, Jr.  
Ahmed J. Davis  
Jeffrey Whieldon  
Fish & Richardson P.C.  
1425 K. Street N.W., Suite 1100  
Washington, D.C. 20005

*Counsel for Microsoft Corporation*



Steven C. Cherny  
Clement J. Naples  
Latham & Watkins, LLP  
885 Third Avenue, Ste. 1000  
New York, NY 10022-4834

David A. Nelson  
Sasha D. Mayergoyz  
Latham & Watkins, LLP  
233 South Wacker Drive, Ste. 5800  
Chicago, IL 60606-6306

David M. Farnum  
Latham & Watkins, LLP  
555 Eleventh Street, NW, Ste 1000  
Washington, D.C. 20004-1304

*Counsel for Alcatel Business  
Systems*

cc: David O. Lloyd, Esq. (Commission Investigative Staff)

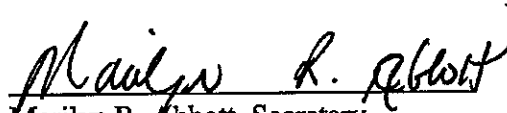


**CERTAIN UNIFIED COMMUNICATIONS  
SYSTEMS, PRODUCTS USED WITH SUCH  
SYSTEMS, AND COMPONENTS THEREOF**

**Investigation No. 337-TA-598**

**CERTIFICATE OF SERVICE**

I, Marilyn R. Abbott, hereby certify that the attached **Order** was served by hand upon Commission Investigative Attorney David O. Lloyd, Esq., and upon the following parties via first class mail, and air mail where necessary, on October 9, 2007:

  
Marilyn R. Abbott, Secretary  
U.S. International Trade Commission  
500 E Street, SW - Room 112  
Washington, DC 20436

For Complainant Microsoft Corporation:

Jeffrey R. Whieldon, Esq.  
**Fish & Richardson PC**  
1425 K Street, NW, Suite 1100  
Washington, DC 20005

John E. Gartman, Esq.  
**Fish & Richardson PC**  
12390 El Camino Real  
San Diego, CA 92130

**CERTAIN UNIFIED COMMUNICATIONS  
SYSTEMS, PRODUCTS USED WITH SUCH  
SYSTEMS, AND COMPONENTS THEREOF**

**Investigation No. 337-TA-598**

**CERTIFICATE OF SERVICE** pg. 2

For Respondent Alcatel Business Systems:

David M. Farnum  
**Latham & Watkins LLP**  
555 Eleventh Street, NW, Ste. 1000  
Washington, DC 20004-1304

Steven C. Cherny, Esq.  
**Latham, & Watkins LLP**  
885 Third Avenue, Ste. 1000  
New York, NY 10022-4834

David A. Nelson, Esq.  
Sasha D. Mayergoyz, Esq.  
**Latham, & Watkins LLP**  
233 South Wacker Drive, Ste. 5800  
Chicago, IL 60606-6306

Renny Hwang, Esq.  
**Latham, & Watkins LLP**  
633 West Fifth Street, Suite 4000  
Los Angeles, CA 90071-2007

F. David Foster, Esq.  
James B. Altman, Esq.  
**Miller & Chevalier Chartered**  
655 Fifteenth Street, NW, Suite 900  
Washington, DC 20005

**CERTAIN UNIFIED COMMUNICATIONS  
SYSTEMS, PRODUCTS USED WITH SUCH  
SYSTEMS, AND COMPONENTS THEREOF**

**Investigation No. 337-TA-598**

**PUBLIC MAILING LIST**

Sherry Robinson  
LEXIS-NEXIS  
8891 Gander Creek Drive  
Miamisburg, OH 45342

Ronnita Green  
Thomson West  
1100 – 13<sup>th</sup> Street NW  
Suite 200  
Washington, DC 20005

**(PARTIES NEED NOT SERVE COPIES ON LEXIS OR WEST PUBLISHING)**

**EXHIBITS 12-17**

**REDACTED IN THEIR  
ENTIRETY**

# EXHIBIT 18



US006445694B1

(12) **United States Patent**  
**Swartz**

(10) Patent No.: **US 6,445,694 B1**  
(45) Date of Patent: **Sep. 3, 2002**

(54) **INTERNET CONTROLLED TELEPHONE SYSTEM**

(76) Inventor: **Robert Swartz**, 1066 Centerfield Ct., Highland Park, IL (US) 60035

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/033,287**

(22) Filed: **Mar. 2, 1998**

#### Related U.S. Application Data

(60) Provisional application No. 60/040,046, filed on Mar. 7, 1997.

(51) Int. Cl.<sup>7</sup> ..... **H04L 12/66**

(52) U.S. Cl. .... **370/352; 379/85; 379/88.01**

(58) Field of Search ..... **370/352, 218, 370/235, 252, 253, 254, 255, 260, 264, 299, 321, 326, 327, 336, 353, 354, 355, 356, 357, 359, 360, 396, 398, 400, 401, 402, 404, 405, 420, 421, 422; 379/68, 69, 70, 71, 85, 88.01, 88.04, 88.27**

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\* cited by examiner

*Primary Examiner*—Douglas Olms

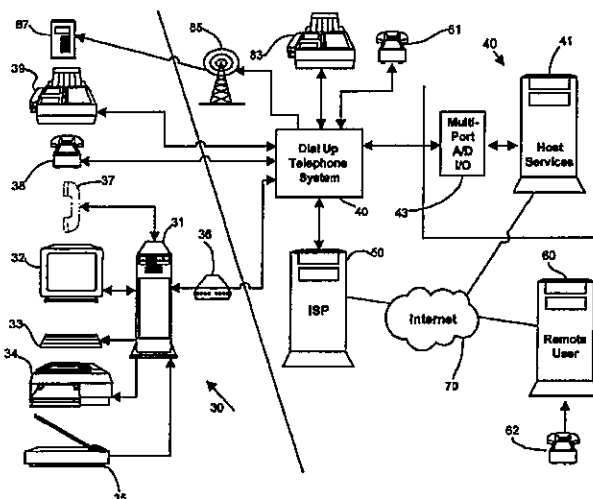
*Assistant Examiner*—Phirin Sam

(74) *Attorney, Agent, or Firm*—Charles G. Call

(57) **ABSTRACT**

An Internet controlled telephony system employing a host services processor connected to a subscriber via the Internet and further connected to the public switched telephone system (PSTN). The subscriber employs a web interface to populate a database with preference data which is used by the host services processor to handle incoming calls and establish outgoing telephone connections in accordance with the preference data provided by the subscriber. Incoming calls to a telephone number assigned to the subscriber may be automatically forwarded to any telephone number specified by the preference data. The subscriber may also use the web interface to specify whether call waiting is to be activated, to screen or reroute calls from designated numbers, for recording voice mail messages in designated voice mailboxes, for selectively playing back voice mail messages via the web interface or for forwarding voice mail as an email attachment, for handling incoming fax transmissions using character recognition and email attachment functions, and for automatically paging the subscriber when incoming voice mail, fax or email messages are received, all in accordance with the preference data supplied by the subscriber using the web interface. Outgoing connections and conference calls may be initiated using the web interface, and the subscriber may block the operation of caller identification functions. Call progress information may be visually displayed to the subscriber during calls by transmitting web pages from the host services computer to the subscriber's web browser.

**13 Claims, 11 Drawing Sheets**





U.S. Patent

Sep. 3, 2002

Sheet 2 of 11

US 6,445,694 B1

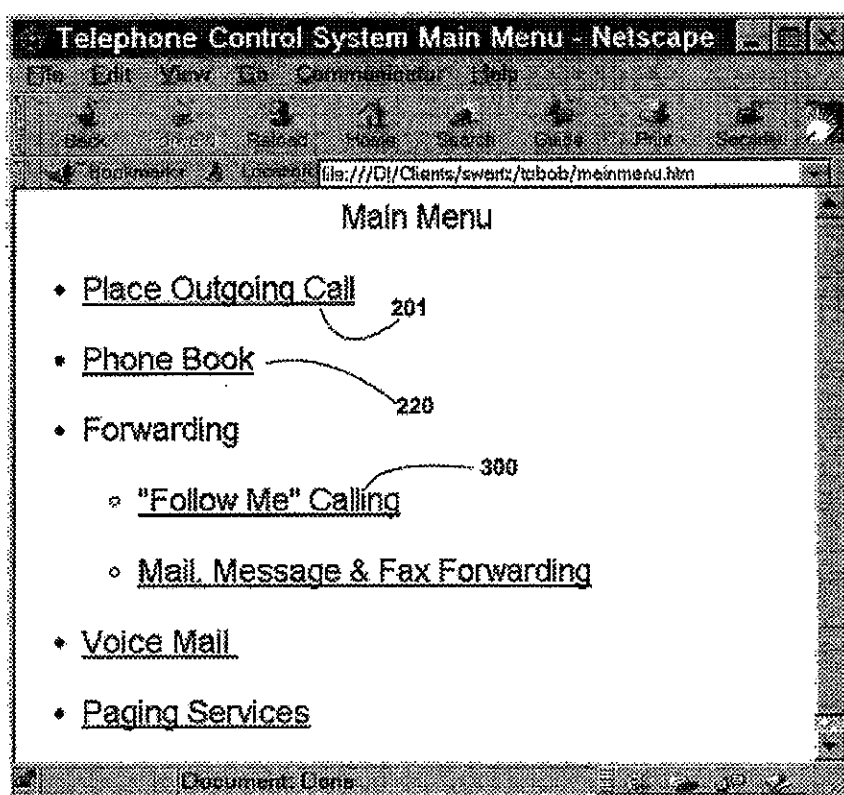


Fig. 2



U.S. Patent

Sep. 3, 2002

Sheet 3 of 11

US 6,445,694 B1

Outgoing Telephone Calls - Netscape

file:///D:/Clients/swartz/tobch/outgoing.htm

Place call to phone #

617-321-6774

205 ☒ Conference in phone numbers below:

617-807-2345	212-443-2345		

209 ☒ Block caller ID display for this call Trace 213

211 ☒ Activate call waiting for this call

Bill code:

Place Call 217

Document: Done

Fig. 3

U.S. Patent

Sep. 3, 2002

Sheet 4 of 11

US 6,445,694 B1

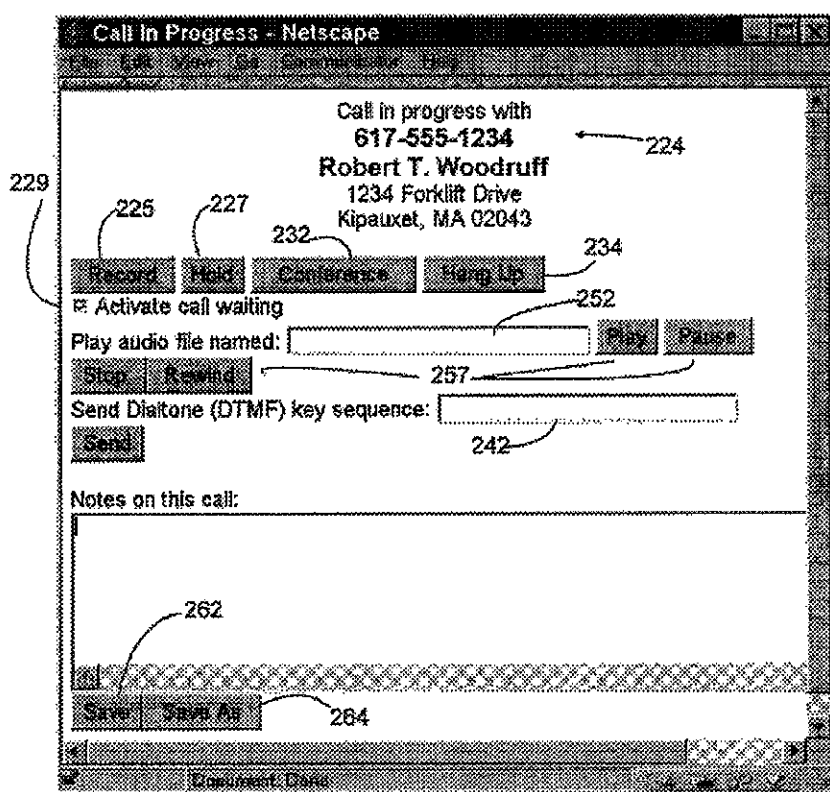


Fig.4

U.S. Patent

Sep. 3, 2002

Sheet 5 of 11

US 6,445,694 B1

Phone Book - Netscape

Click on any name to view or revise detail

NAME	PHONE NO.	FAX NO.	EMAIL
<a href="#">Abrams, John</a>	(202) 234-1234	(202) 234-1299	abrams@lincolnx.com
<a href="#">Baxter Chemical</a>	(312) 123-4567	(312) 123-9921	sales@baxterchem.com
<a href="#">Bartholomew, Ken</a>			kbart@wiggles.com
<a href="#">Branson, Charles</a>	(415) 555-1212	(415) 345-9908	
<a href="#">Candy, Wilson</a>	(617) 890-0987		CWilson12@aol.com

272 A-C | D-F | G-I | J-L | M-O | P-R | S-U | V-Z | Add New 274

Fig. 5

U.S. Patent

Sep. 3, 2002

Sheet 6 of 11

US 6,445,694 B1

Phone Book Entry - Netscape

Name:  Priority Level:

Mailing Address:

Phone No.:

Fax No.:

Pager No.:

Email:

282 Handle calls and messages from this person as follows:

☐ Accept no calls from this number.

Save Faxes in Directory:   292

Route phone calls to Voice Mailbox:   289

☒ Send to voice mail if unanswered

☐ Don't answer & send to voice mail

286 ☐ Accept no voice mail

Save Email from this person in Mail Box:   294

276

Fig. 6

U.S. Patent

Sep. 3, 2002

Sheet 7 of 11

US 6,445,694 B1

Follow Me Calling Options Netscape

**"Follow Me" Voice Calling Options**

☒ Attempt Internet voice connection to subscriber before forwarding.

☐ Forward incoming voice calls to  except:

From		To		Forward to
Date*	Time	Date*	Time	Phone Number
9/4/1998	10:00 am	9/12/1998	5:30 pm	212-555-1299

\* Specify specific date ("9/5/98"), or set weekly or monthly schedule by entering day of week ("Monday"), or day of the month ("7"). First time period to be satisfied, from the top down, will control call forwarding.

Document Date

Fig. 7

U.S. Patent

Sep. 3, 2002

Sheet 8 of 11

US 6,445,694 B1

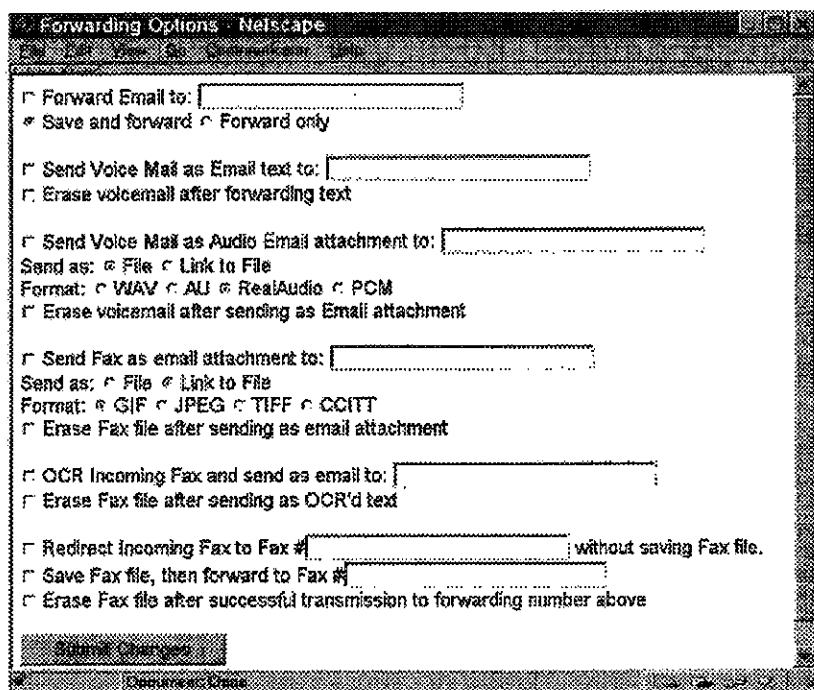


Fig. 8

U.S. Patent

Sep. 3, 2002

Sheet 9 of 11

US 6,445,694 B1

Voice Mailbox Services - Netscape

Mailbox name: Jim Jones [Go to](#) [Add New Mailbox](#) [Edit Mailbox](#) 321

☒ Also Send Voice Mail as Email text to:

☒ Also Send as Audio Email attachment to:

Send as: ☒ File ☐ Link to File

Format: ☐ WAV ☐ AU ☐ RealAudio ☐ PCM

☐ Filename of Greeting Recording:

☒ Greeting Text:  
James Jones is not available. Please leave a message at the sound of the tone

Pending Voicemail:

Date	Time	From	Beginning . . .	Action
9/4/98	10:15 am	617-345-0123	THIS IS BOB WILSON . . .	<a href="#">Hear</a> <a href="#">Read</a> <a href="#">Delete</a>

Fig. 9

U.S. Patent

Sep. 3, 2002

Sheet 10 of 11

US 6,445,694 B1

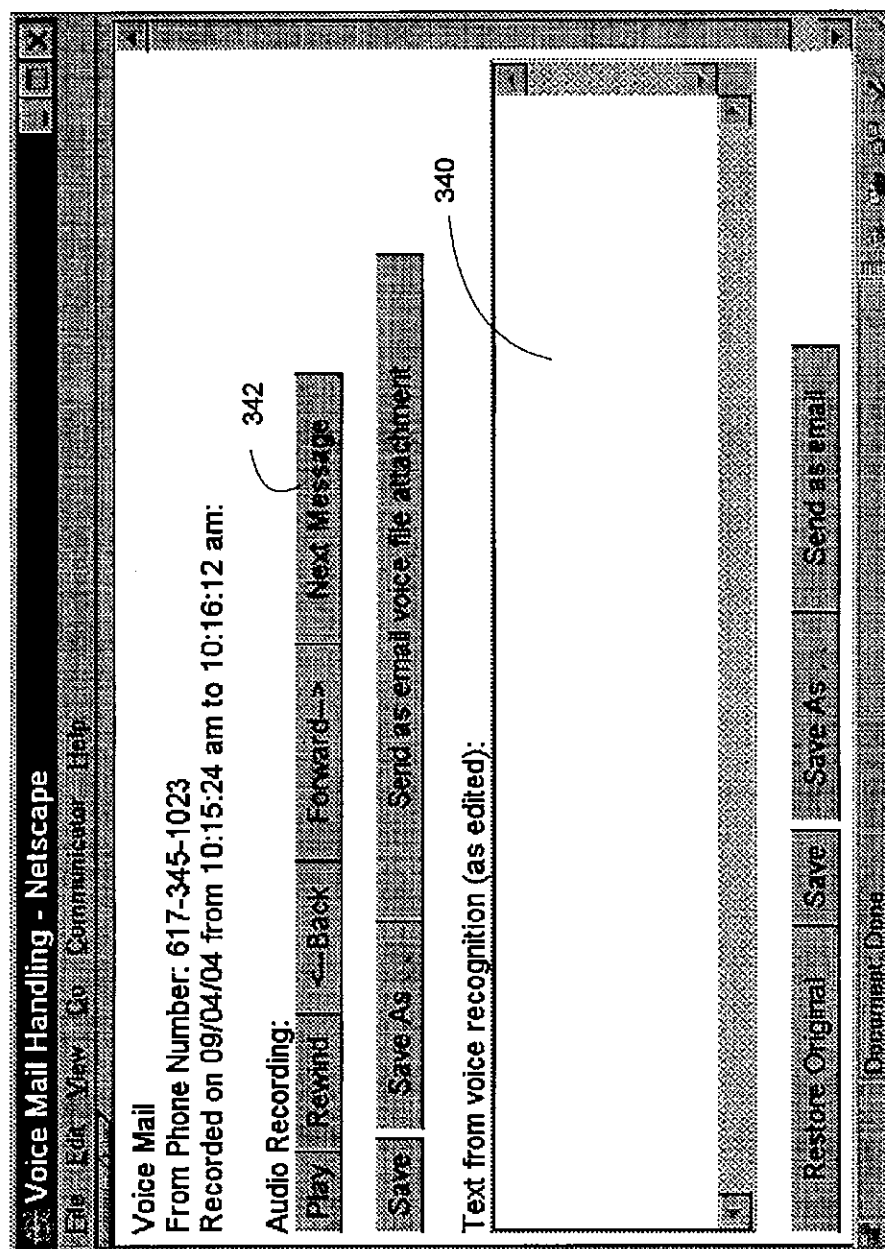


Fig. 10



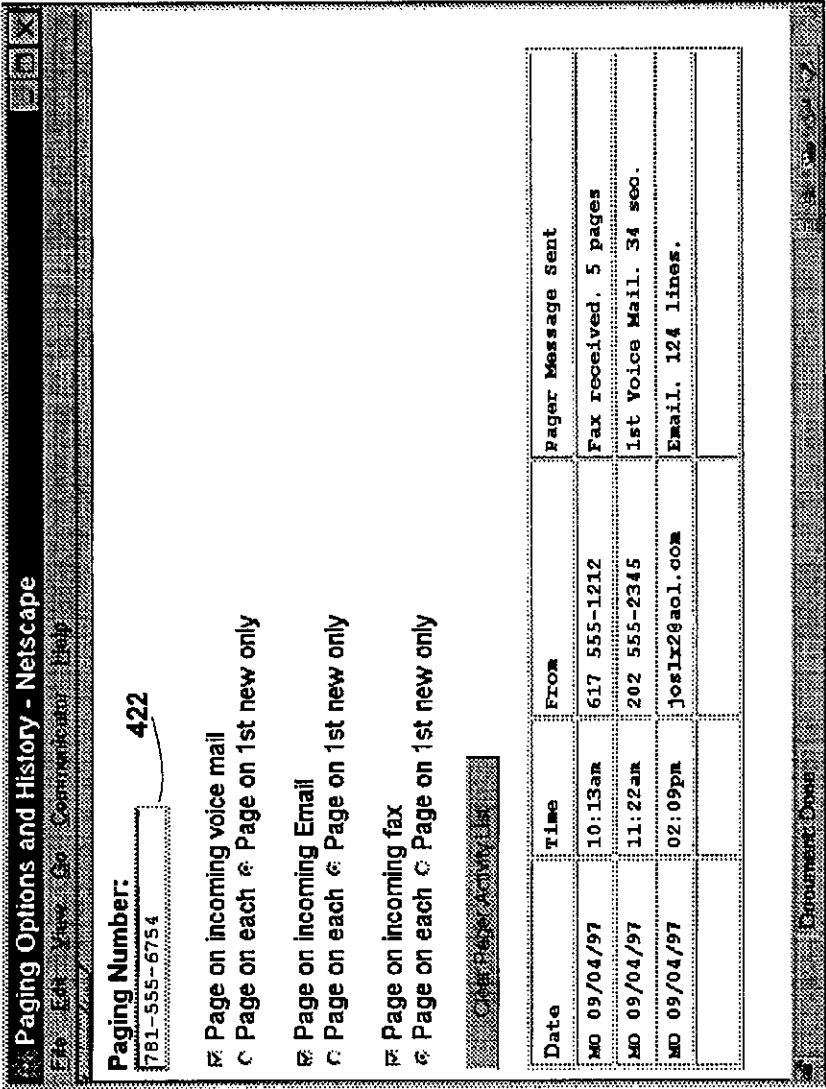


Fig. 11

US 6,445,694 B1

1

**INTERNET CONTROLLED TELEPHONE  
SYSTEM****CROSS REFERENCE TO RELATED  
APPLICATION**

This application claims the benefit of the prior filed  
compending U.S. Provisional Patent Application Ser. No.  
60/040,046 filed on Mar. 7, 1997.

**FIELD OF THE INVENTION**

This invention relates to computer controlled telephone  
systems and more particularly to a telephone system which  
may be controlled using commands transmitted from a  
subscriber location over the Internet to a host computer  
which provides telephone services.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a schematic diagram showing an illustrative  
arrangement of hardware components which provide the  
infrastructure for implementing a preferred embodiment of  
the invention;

FIG. 2 shows the screen display of a main menu giving  
options available to the subscriber;

FIG. 3 illustrates a screen displayed to enable the sub-  
scriber to place a call and request a conference call;

FIG. 4 depicts an illustrative screen display which enables  
the subscriber to control a call in progress;

FIG. 5 is a screen display presented to enable the sub-  
scriber to review and select particular persons or firms listed  
in a phone book database;

FIG. 6 shows a screen displayed when a form is presented  
to enable the subscriber to add or edit information in a phone  
book entry and to take place calls and the like to the person  
listed;

FIG. 7 illustrates a screen which is displayed to enable  
call forwarding and "follow me" calling;

FIG. 8 illustrates a further screen display which enables  
the subscriber to select and change a variety of call and  
message forwarding options;

FIG. 9 is a screen display which enables the subscriber to  
create and specify features of a voice mailbox;

FIG. 10 is a screen display which allows the subscriber  
to view and control the playback of voice messages left in  
a voice mailbox; and

FIG. 11 is a screen display which enables the user to select  
various options and control the operation of an automatic  
paging system implemented by the disclosed embodiment of  
the invention.

**DETAILED DESCRIPTION**

The infrastructure used to implement the present inven-  
tion may consist entirely of conventional and readily avail-  
able hardware and software components. As will be seen  
from the discussion that follows, the hardware and software  
used at the subscriber (client) location is already present and  
in use in many well equipped home and small office com-  
puter installations. Similarly, the principal hardware and  
software components needed by the host services computer  
(server) are similarly readily available, as are the software  
development tools needed to prepare the limited amount of  
special purpose programs required for execution at the  
server.

FIG. 1 of the drawings shows the manner in which various  
conventional hardware components may be interconnected

2

to provide an illustrative hardware infrastructure for imple-  
menting the invention. The arrangement seen in FIG. 1  
provides the facilities needed for controlling a variety of  
communications services, including telephone, email, fax  
and paging services provided by a host services computer  
operating under the control of either or both (1) a World  
Wide Web interface and (2) a telephone interface.

A typical subscriber location seen at 30 includes, by way  
of example, a personal computer 31, a monitor 32 for  
displaying text and images, a keyboard 33 for entering data  
and commands from the user, a printer 34, a digital scanner  
35, a modem 36 and a microphone and headset/speaker  
represented in FIG. 1 by the handset 37.

The modem 36 is used to establish a dialup telephone  
connection via the conventional telephone network 40 to a  
remote computer 50 which operates as an Internet Service  
Provider (ISP). The ISP computer 50 provides the connected  
computer 31 with access to the Internet, enabling the sub-  
scriber computer 31 to exchange data via the Internet seen  
at 70 in FIG. 1 with other computers, such as the computer  
41 at the host services location 40 and a computer 60 which  
is representative of a selected one of the millions of remote  
computers connected to the Internet. The dialup connection  
between computers 31 and 50 seen in FIG. 1 is merely  
illustrative of one common method for connecting a sub-  
scriber location to the Internet. Alternatively, the conven-  
tional modem 36 may be replaced by a cable modem,  
satellite connection, local area network gateway, proxy  
server or a connected router. All such communications  
facilities and the components for providing Internet access  
are conventional.

The host services computer 41 is connected to the Internet  
70 and employs a multi-port input/output (I/O) unit 43 to  
permit a number of outside callers to be concurrently  
connected via the dialup telephone system 40. The dialup  
telephone system 40 also provides conventional connections  
to a conventional telephone stationset 38 and a conventional  
facsimile machine 39, both of which are provided with  
separate assigned lines and telephone numbers for use at the  
subscriber location 30. In addition, the telephone system 40  
may also interconnect any other connected telephone or  
facsimile machine, as illustrated at 81 and 83 respectively,  
as well as other services, such as a remote radio transmission  
facility 85 used to provide communication to a pager 87  
which is assigned to and used by the subscriber. Similarly,  
the subscriber may utilize a cellular phone (not shown) when  
traveling to remote locations. As discussed below, the sub-  
scriber controls and uses the host service computer using  
these conventional instrumentalities. Importantly, conven-  
tional web browser software running on the computer 31  
may be employed, along with voice commands and DTMF  
(dialtone) signaling via the conventional telephone hookup,  
to control the state and function of the host services com-  
puter 41.

The host services computer may alternatively take the  
form of an Intranet server which is connected to a plurality  
of client (subscriber) computers by means of a local area  
network and/or a wide area network. In addition, the host  
services computer may be connected via a multiport I/O  
device to serve a number of telephone stationsets. In this  
arrangement, the host services computer operates as both a  
shared computer resource for the connected client computers  
and provides PBX services to the connected subscriber  
telephone stationsets. Internet connections are provided via  
an Internet gateway on the LAN/WAN such that both the  
host services computer and the connected subscriber com-  
puters have Internet access.

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Note further that, with the host services computer operating as a PBS, a direct telephone voice line connection may be established between host services computer and individual telephone subscriber stationsets. In this way, incoming calls may be directly connected to the called subscriber stationset without forwarding the incoming call through the dialup telephone facility. A multiplexed telephone line, such as a leased T1 carrier line, may be used to connect a plurality of subscriber phones to the host services computer, enabling the servicing of branch offices. By concentrating traffic in a shared wideband leased line, branch locations can be served through a central PBX provided by the host services computer at less cost by eliminating individual lines.

The host services computer 41 may employ conventional server operating system software, such as the SCO OpenServer operating system sold by The Santa Cruz Operation, Inc. (SCO), Santa Cruz, Calif. 95061. This client/server UNIX operating system for Intel processor-based platforms includes graphical system administration and software management facilities for managing both local and remote systems. The program's Motif GUI provides the look and feel of Microsoft Windows and includes TCP/IP communication gateway services for local and network access external information services. The computer 41 may advantageously be equipped with an enhanced audio input/output facilities, such as the Dialogic D/240SC 24 channel digital interface board which provides a voice channel interface between the computer 41 and incoming audio channels from the connected telephone lines as well as call management functions. The D/240SC is marketed by Dialogic Corp. of Parsippany, N.J. 07054. As discussed below, it is the principal function of the host services computer 41 to receive and respond to data and commands received from the subscriber location 30, either in the form of HTML form submissions or in the form of voice and/or dialtone commands, and to perform requested functions in response to those commands.

#### Web Interface

A wide variety of available interface mechanisms can be utilized to facilitate communications and control between the subscriber and the host services computer. As described in more detail below, a highly effective interface may be readily implemented using a conventional HTML web pages which are sent to the subscriber computer from the host services computer, including HTML forms which are transmitted to request and accept specific information from the subscriber using as "fill-in-the-blanks" input boxes, memo boxes, check boxes, and radio buttons. Javascript may be advantageously included in the HTML pages to provide validity checking of entered data by the subscriber computer. Alternatively, these and other interface functions and "client-side" operations may be implemented special purpose "plug-in" programs which work with a conventional browser program, or by Java and/or Active-X applets which are transmitted from the host services computer for execution on the subscriber computer using facilities provided by the browser. If desired, special-purpose client application programs may be used to directly communicate with the host services computer without using a general purpose browser.

In one particularly useful form, the functions performed at the subscriber location as contemplated by the present invention can advantageously be implemented by routines stored as dynamic link libraries which make telephone subscriber functions available through an open application program interface (API). By way of example, the widely used Microsoft Windows 95 operating system provides specifications for a robust computer/telephone interface

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named "TAPI" which is fully documented in the Microsoft Win32 Software Development Kit (SDK) which includes documentation, tools, and sample code to assist application programmers in adapting programs to be compatible with TAPI. Two documents, the *Microsoft Telephony Programmer's Reference* and the *Microsoft Telephony Service Provider Interface (TSPI) for Telephony*, are also available from Microsoft Corp. to provide additional development guidance. The programmer's reference is intended to document the functionality that an application using TAPI will need. The service provider documentation assists developers and telephone equipment vendors in writing their own TAPI services.

Telephone services are integrated into Windows using the Windows Open Systems Architecture ("WOSA"). WOSA uses a Windows dynamic-link library (DLL) that allows software components to be linked at runtime. In this way, applications are able to connect to services dynamically. An application needs to know only the definition of the interface, not its implementation. Telephony services under Windows follow the WOSA model. This means that there exists a Telephony API, which is the application programmers access to telephony services, a Telephony SPI (Service Provider Interface) which is implemented by telephony service vendors, and a Telephony Dynamic Link Library (the TAPI DLL) which is part of the Windows operating system. Applications are presented with a uniform set of devices accessed uniformly via the API without needing to know which service provider actually ends up controlling which device. Similarly, service providers just execute requests on behalf of the Windows Telephony DLL; they are unaware that these requests are the result of multiple applications using the API. The SPI definition reflects this single user model at the service provider level. All this multiplexing/demultiplexing of requests and replies is confined to the Telephony DLL. In an environment with multiple PCs on a local area network, it is possible to develop applications and/or service providers that are distributed in nature. With a distributed service provider, a service provider instance on one client PC is able to communicate with its peers on other client PCs, providing potentially a more powerful model as it can combine knowledge about multiple client PCs that may be involved with the same call. The services provided by the line and phone abstractions of the Telephony SPI can be partitioned into three classes:

- (1) Basic Services are a minimal subset of core services. They must be provided by all service providers. The function contained in basic telephony roughly correspond to that of POTS. Phone device services are not part of basic telephony.
- (2) Supplementary Services are the collection of all the services defined by the SPI, but not included in the basic telephony subset. It includes all so-called supplementary features found on modern PBXs including hold, transfer, conference, park, etc. All supplementary features are optional. This means that a service provider decides which of these services it does or does not provide. The TAPI DLL can query a line or phone device for the set of supplementary services it provides. Note that a single supplementary service may consist of multiple function calls and messages. It is important to point out that the Telephony SPI defines the meaning (i.e., behavior) for each of these supplementary features.
- (3) Extended Services (or Device Specific Services) include all service provider defined extensions to the SPI. A mechanism is defined in the SPI, and reflected

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in the API, that allows service provider vendors to extend the Telephony SPI using device-specific extensions. Since the SPI only defines the extension mechanism, definition of the extended service behavior must be completely specified by the service provider. The extension mechanism allows a service provider to define new values to enumeration types and bit flags, as well as to add fields to data structures. The interpretation of extensions is keyed off of the service provider's manufacturer ID. Special function and callbacks are provided in the SPI that allow an application to directly communicate with a service provider. Many of the control functions contemplated by the present invention which are controlled through the TAPI interface by the SPI DLL are in fact executed, as will be described, by the host services computer in ways that are invisible to the user or the application program which is executing on the subscriber computer.

As an alternative to the TAPI implementation noted above, the host services computer may present an API to programs which execute on the subscriber computers and communicate with the host computer over the Internet or an equivalent data pathway. With the remote host services computer providing an API which makes available a set of telephony functions, application programmers may implement a rich and expandable set collection of special purpose programs which execute on the subscriber computer to implement the features and functions such as those described below in the example HTML/CGI implementation of the invention. When these application programs take the form of Java applets or Active-X applets that are downloadable from the host services computer to the subscriber computer, the necessity for resident special purpose software at the subscriber location is eliminated and the cost savings associated with "thin client" network computer architectures are preserved.

HTTP/CGI Control

While such special purpose programs of the type noted above provide a high degree of interoperability with other application programs, they must be specially loaded for execution into each subscriber computer. By using the capabilities found in existing web browser software, it is possible to provide the desired functionality with no new software of any kind being required at the subscriber location. Thus, in perhaps its simplest form, the present invention can be readily implemented by using a conventional web browser program (e.g. Netscape Navigator or Microsoft Explorer) which executes on the subscriber computer 31 seen in FIG. 1, and conventional web server software (e.g. BSD Unix 2.2, Apache 1.1.1) or an SQL server which interoperates with a relational database (such as the Sybase SQL Server V.11). On the server side, web page requests or form submission from the subscriber computer's web browser are sent to the host services computer 41 using the HTTP protocol. At the host services computer 41, the received transmissions from the subscriber location may be handled by Common Gateway Interface (CGI) programs which typically process information from the subscriber and return HTML pages for display on the subscriber's web browser. The HTTP/CGI interface infrastructure is conventional and is described, for example, in *Developing CGI Applications with PERL*, by John Deep and Peter Holfelder, John Wiley & Sons (1966), ISBN 0-471-14158-5.

To establish a working relationship between the host services computer and the subscriber, the host services computer makes available to the public at large a "home page" at a predetermined URL (Universal Resource

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Locator). The home page, when displayed, identifies and makes available descriptive information about the system, inviting members of the public to subscribe to the offered services by displaying, completing and submitting a subscription form.

The HTML subscription form shown enables user to establish an account with the operator of the host services computer. When the subscription form is submitted, the host services computer stores the descriptive information entered on the submitted form in persistent storage (typically a database on a local magnetic disk drive) accessible to the host computer. As is conventional, the subscription process may advantageously employ conventional secure encrypted communications protocols for obtaining the subscriber's credit card number and authorization to facilitate billing. As will be understood, the subscriber may be billed for services based on monthly fees or measured use of the system at rates which, because of economies achieved by the system, may be significantly lower than the costs associated with such services when provided by conventional means. When the subscription form is received and accepted, the new subscriber may be sent a user ID and password (which may be done by conventional mail at the same time user manuals or other information is supplied to the subscriber).

In accordance with an important feature of the invention, the subscriber can access his or her personalized phone services and database from any computer having access to the Internet, and need not be limited to a particular computer on which special programs or data are stored. At the same time, the password protection afforded by the system assures the security of the information stored for access by the subscriber. The host services may be advantageously provided by an existing services provider, such as an Internet Services Provider (ISP), a cable modem company, a telephone access provider, an telephone answering service, a paging services company, or the like.

At the same time the new subscription account is established, the host service assigns a telephone number to the new subscriber service and informs the subscriber of that assigned number (which may conveniently be an 800 or 888 number, eliminating the need for the subscriber to independently obtain 800 or 888 number service). This telephone number will be referred to hereafter as the "assigned subscriber number". Any call to the assigned subscriber number is answered by and handled by the host services computer 41 in the manner determined in part by preference data provided by the subscriber using HTML forms as described in more detail below, or by transmitting voice or DTMF commands over the conventional telephone system.

Using the web browser software running on the subscriber computer 31, the subscriber accesses a predetermined (and typically bookmarked) web page at a predetermined URL. The host services computer responds with a request to the subscriber to enter his or her assigned user ID and password, and if that step is performed satisfactorily, the host services computer transmits a main menu webpage of the type illustrated in by FIG. 2.

The main menu page seen in FIG. 2 provides hypertext links to six different web pages, each of which is also illustrated in the drawings as shown by the table below:

Menu Anchor Text	Drawing
Place Outgoing Call	FIG. 3
Phone Book	FIG. 5



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-continued

Menu Anchor Text	Drawing
"Follow Me" Calling	FIG. 7
Mail, Message & Fax	FIG. 8
Forwarding	FIG. 9
Voice Mail	FIG. 11
Paging Services	

#### Place Outgoing Call

When the subscriber "clicks on" the anchor text "Place Outgoing Call" at 201 on the main menu webpage seen in FIG. 2, the browser sends a request for a further webpage specified by a URL associated with the anchor text in the HTML text which created the main menu.

Note that, in general, the value of a URL sent when a hyperlink is activated is the file location of web page or a predetermined CGI script, along with parameters passed to the server for execution by that script. Note that, in general, because the hypertext links (URL's) that are sent to the server are formed from text on pages written by the server, the URL may contain state information, either in the form of a file designation or in the form of CGI parameters, which identify the subscriber as well as the context in which the subscriber is making a request, and the specific request or data being sent to the server.

The selection by the subscriber of the main menu option represented by the hypertext anchor text "Place Outgoing Call" causes the HTML for displaying the form seen in FIG. 3 to be displayed by the browser. This form allows the user to enter a phone number to be called in the input line form control at 203. In addition, by clicking on the checkbox at 205 and entering one or more numbers in the input line boxes arrayed in a table at 207, the subscriber may specify the telephone numbers of additional parties to be included in a conference call. The conference call may be implemented directly by the host services computer 41 which places all calls to all of the numbers specified in the form seen in FIG. 3, or the conference call may be requested from the dial up telephone system.

#### Control of Telephone Central Office Services

Most public telephone services offer a variety of service functions which can be advantageously implemented using the user interface features of the present invention. To use many of these functions, the user must normally know and key-in control key sequences on the telephone keypad. In accordance with a feature of the present invention, these functions may be advantageously automated by the host services computer in response to easily understood menu selections made by the subscriber using the webpage interface or voice command interface. The conventional telephone system functions which can be advantageously implemented in this way include those shown in the following illustrative examples, described using the control dialtone key sequence command codes employed by the Bell Atlantic telephone service. These functions include the activation and deactivation of call waiting services under the control of the HTML checkbox form control seen at 211 in FIG. 3, the blocking and unblocking of caller ID displays in response to the checkbox entry at 209 in FIG. 3, and the activation of call tracing.

As an alternative to the use of DTMF key sequences to control telephone central offices, the SS7 call management protocol may be used. AT&T developed and made available a set of LAESS features called LASS (Local Area Signaling Services). As expanded by customized software enhancements originating with Pacific Bell, these functions are also

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available under the name CLASS (Custom Local Area Signaling Services). These services allow increased customer control of phone calls. Existing customer lines can be used provide call management and security services. A key feature of CLASS resides in the ability of the terminating office to obtain the identity of the calling party. Special terminating treatment based on the identity of the calling party can then be provided. The CLASS features are dependent upon an SS/CCS (Signaling System 7/Common Channel Signaling) network and use the SS7 Call Management Mode of operation. SS7 is an advanced signaling system that features flexible message formatting, high speed data transmission (56/64 kbps) and digital technology. CCS is defined as a private network for transporting signaling messages. In the existing voice and signaling network, signaling and voice use the same path but cannot use it at the same time. With SS7, signaling and voice have been separated. Signaling (SS7) is over a high-speed data link which carries signaling for more than one trunk. In the context of the present invention, the SS7 protocol provides a more direct and effective way for the host services computer to control the functions of the connected dialup telephone system than the conventional DTMF signaling mechanisms which are set forth here for simplicity.

If the subscriber wishes to prevent the called parties caller ID system from displaying the subscribers number on the next call, the box at 209 is checked and the host services computer requests the central office to perform per call blocking by sending the dialtone sequence "\*67" to the central office. If the telephone company has been requested to block caller ID display on all outgoing calls, the line associated with checkbox 209 would instead read "Unblock display of your number by caller ID for next call only" and the host services computer would instead send the sequence "\*82" to remove perform line blocking for the next call only. The host services computer can interrogate the central office to determine whether or not line blocking has been requested by dialing a predetermined number which will provide an announcement indicating line blocking status for the calling number.

The functions noted above may be performed by the telephone central office in response to command codes sent from the host services computer to the central office. Call waiting is activated when the checkbox at 211 is checked by sending the key sequence "\*70" to the central office, and is deactivated by the sending same code when the box on line 211 is unchecked.

If only one additional party is to be conferenced in, the commonly available "three way calling" service offered by telephone system may be used. When the user enters the telephone number of the third party to be added to an existing call at 207 and checks at 205, the host services first dials the number entered in input line 203 and, when that connection is established, the computer flashes the line (i.e., places the line on-hook momentarily), waits for three beeps and a dial tone from the central office, dials the number previously entered at 207, and when the added party answers, again flashes the line to bring all three parties together for the desired conferenced call. If the third party line does not answer or is busy, the subscriber is notified of that condition and the line is flashed twice to reconnect the first call.

When the button 213 on the form seen in FIG. 3 is pressed, a command is sent to the host services computer request a trace of the last incoming call. In response, the host services computer returns a form (dialog box) advising the subscriber of a service charge will be incurred and request-

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ing confirmation that the requested function should nonetheless be performed. If confirmed by the subscriber, the host services computer transmits the dialtone key sequence “\*57” to the central office, which thereafter provides announcements to the subscriber indicating that the call was traced and providing further instructions.

After the information in the input line 203 identifying the number to be entered is completed, and optionally the conferenced-in numbers are entered at 207, the user presses the button labeled “Place Call” at 217. In response, the server dials the call to establish a voice connection with the called party or parties, and displays the call-in-progress form seen in FIG. 4.

As the call progresses, the normal audible signals (busy signals, ringing signals, etc.) are sent to the subscriber over the telephone voice connection, and may be supplemented by additional voice status announcements. Typically, such notifications to the subscriber may be sent by both voice announcement and audible signals over the voice connection or by sending status displays in the form of revised HTML pages for display on the subscriber’s monitor. In accordance with the invention, notification messages displayed on the monitor are frequently less disruptive; accordingly, by checking the checkbox seen at 223 on the form of FIG. 4, the subscriber may disable the supplemental voice announcements.

The full identification of the incoming party is displayed on the call-in-progress form as indicated at 224. To provide this complete display, the host services computer matches the telephone number of the calling telephone, provided by the telephone system’s automatic number identification (ANI) service, against a “phone book” database (to be discussed later) of frequently used phone numbers to obtain, in addition to the ANI information, other descriptive information about the calling party. The name or number of the calling party may form the anchor text for a hyperlink to even more detailed phonebook information about the party of the type to be discussed later in connection with FIGS. 5 and 6.

When the subscriber places a call to a busy line, or if there is no answer before a time out period expires, the host services computer presents a dialog box form to the subscriber showing the status (“No Answer” or “Busy”) and displaying a request prompt “Continue automatic redialing?” [Yes, No]. If redialing is requested, it may be performed by the host services computer or, in the alternative, the central office may be requested to perform repeat dialing by sending the key sequence “\*66”. Repeat dialing by the central office may be deactivated on the request of the subscriber by notifying the host services computer which, in turn, transmits the dialtone sequence “\*68” to deactivate central office repeat dialing.

Other call in progress controls which are provided by the call-in-progress form of FIG. 4. The button 225 labeled “Record” may be pressed to create a recording of the conversation, preferably by first generating a confirming dialog box and, if desired, informing the called party by voice announcement or signal, as appropriate, that the conversation is being recorded. By pressing the “Hold” button 227, the call in progress may be placed on hold in the normal way so that, for example, an incoming call signaled by the “call waiting” function can be handled. So that more important calls or data connections are not interrupted, call waiting may be deactivated by checking the checkbox at 229. By pressing the button 232 labeled “Conference,” the subscriber may request to have additional parties included in a conference call, which is accomplished by again display-

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ing the outgoing call specification form seen in FIG. 3. The subscriber may terminate a call by simply placing the handset on hook in the usual fashion, or by pressing the “Hang up” button 234 which has the same effect.

It is frequently desired to send a predetermined DTMF key sequence after a connection is established in order to perform specialized functions. In addition, it may be desirable to play a predetermined audio file so that it can be heard by the party with whom a connection has been established. To send a DTMF key sequence, it may be entered in text in on the input line at 242 and then sent by pressing the form button 246 labeled “Send.” Similarly, the filename or other designation of an audio file recorded at the server computer 41, or the URL of an audio file available on the Internet, may be entered in the input line at 252. The designated audio file is sent over the voice telephone connection under the control of the buttons at 257 labeled “Play,” “Pause,” “Stop” and “Rewind.”

For the convenience of the subscriber, notes on the call in progress may be entered in the memo box seen at 262 in FIG. 2. Pressing the “Save” form button at 264 causes the entered notes to be saved as a file at the server at a location accessible by accessing the phone book entry for the party as discussed in connection with FIG. 6. Alternatively, by pressing the “Save As” button, the subscriber is presented with a form that enables the notes to be saved at a named location on persistent storage accessible to the host services computer. Note that such information is saved at the host services computer 41 and not at the subscriber computer 31 so that the information saved is available to the subscriber regardless of the particular client computer used to access the system. It is an important feature of this aspect of the invention that subscriber may access his or her personal information from any location using any web browser and/or telephone subscriber station, such as a public telephone at an airport.

#### Phone Book

Frequently called numbers may be accessed and dialed using a phone book database of information. By clicking on the hyperlink anchor text “Phone Book” seen at 270 on the main menu of FIG. 2, a phone book listing page illustrated in FIG. 5 may be displayed. This listing displays an alphabetical list of persons and firms previously stored by the subscriber. Using the page designating navigation bar listing seen at 272 in FIG. 5, the subscriber may go to any desired subsection of the phone book to find an existing listing. By clicking on the name of the person or firm of interest, a form containing more detailed information is presented as shown in FIG. 6. If the person of interest is not found on the listing of FIG. 5, the hyperlink anchor text “Add New” at 274 at the right side of the navigation bar 272 may be clicked on to display a blank form of the type shown in FIG. 5 to enable a new entry to be created.

The form seen at FIG. 6 accepts and, when submitted, stores information about frequently called numbers and is the source of database information displayable at 224 in the call-in-progress form. Notes saved during previous conversations with the person identified on the form may be viewed by pressing the button labeled “See Notes” at 276 in FIG. 6. Note that this button will only be present when notes have been previously recorded for that person or firm; otherwise, the CGI script which generates the form in response to the activation of the associate hyperlink on the form of FIG. 5 will not include the button on the generated form. The phone book data itself may be advantageously stored using a conventional SQL server which interoperates with a relational database (such as the Sybase SQL Server V.11).

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The database for each called number potentially includes not only the phone number for that party, but also fax and pager numbers and email addresses. Phone calls, fax transmissions, paging transmissions and email messages may be initiated immediately from the form seen in FIG. 6 by pressing the appropriate one of the activation buttons seen at 280. In addition, by checking the checkbox at 282, calls originating from this caller may be screened and blocked altogether, or may be routed to voice mail according to the instructions provided by the subscriber selectable radio button options indicated at 286. The drop-down list box at 289 permits the subscriber to designate the voice mailbox to which voice mail from this caller is directed. Similarly, the drop-down list boxes at 293 and 294 respectively allow the subscriber to designate the mailbox locations for fax transmission files and email messages received from this caller. When the form is completed to the subscriber's satisfaction, the information it contains is saved for future use in the database maintained by the host services computer when the subscriber presses the "Save as Shown" button 299 at the bottom of the form of FIG. 6.

#### Call Forwarding

When hypertext option 300 is clicked on the main menu form seen in FIG. 2, the form seen in FIG. 7 is displayed on the subscriber's monitor. This form allows the subscriber to specify the manner in which incoming calls are forwarded and implements "Follow me" call forwarding to enable calls to be automatically forwarded to one of plurality of different numbers in accordance with a predetermined time schedule.

First, at the times when the subscriber is using a particular computer, he or she may place a checkbox at 302 to instruct the host services computer to attempt to establish a voice connection via the Internet using IP telephony to the IP (Internet Protocol) address being used (during this session) by the subscriber computer. IP telephony uses the Internet to send audio between two or more computer users in real time, so the users can converse, and offers the ability to combine voice and data on one network. IP telephony also offers low-cost long distance "telephone" service (assuming the user already has a multimedia PC and a fixed-rate Internet service provider [ISP] account). IP gateways bridge the traditional circuit-switched telephony world with the Internet and offer the advantages of IP telephony to the most common, cheapest, most mobile, and easiest-to-use terminal in the world: the standard telephone. The gateway takes the standard telephone signal, digitizes it (if it is not already digital), significantly compresses it, packetizes it for the Internet using Internet Protocol (IP), and routes it to a destination over the Internet. The gateway reverses the operation for packets coming in from the network and going out the phone. Both operations (coming from and going to the phone network) take place at the same time, allowing a full-duplex (two-way) conversation. Gateway products which may be used at the host services computer 41 are conventional and may be obtained from Dialogic and other vendors, and are compatible with client (subscriber) software which enables the connected subscriber computer to receive and send voice signals over the IP connection. When IP telephony is used, the subscriber uses the handset 37 for voice communications with the handset 37 being connected to the soundcard of the subscriber PC; otherwise, the handset is connected to the telephone subscriber line (which may be shared with the modem 36 for data).

If the checkbox 302 is not checked, the host services computer uses the Internet connection for control functions, but establishes a voice connection via the conventional dialup telephone line. Normally, the host services computer

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is directed to forward calls to the number entered in the input box at 305 in FIG. 7 except when a time period specified by the four leftmost columns in the table at 310 is satisfied, in which case incoming calls are instead forwarded to the number in the associated right hand column.

The host services computer activates call forwarding by taking the line carrying the incoming call off-hook, sending the key sequence "#72" to the central office and, when dial tone is received from the central office, dialing the forwarding number previously entered by the subscriber on line 2. When the called number answers, call forwarding is activated; otherwise, if there is no answer or a busy signal, a dialog box (not shown in the drawings) is displayed on the subscriber's monitor (if active), asking the subscriber if the attempt to activate call forwarding should be attempted by redialing until canceled.

#### Message Routing

The subscriber may control the manner in which Email, voicemail and fax transmissions are handled using the form seen in FIG. 8. To effect email handling, the host services computer operates as a POP mailbox and SMTP server for receiving and sending email respectively. In order to coordinate email, voicemail and fax transmission, the host services computer may advantageously employ a set of conventional format conversion functions including: voice to text speech recognition for converting voice mail into text form suitable for transmission via email as well as by voice file MIME attachments to email; optical character recognition for translating fax transmissions into text form for email transmission as well as by MIME fax file attachments to email. The information provided on the form of FIG. 8, which is self explanatory, allows email, fax and voice mail messages to be forwarded, stored, and redirected in a variety of ways in response to option selections made by the subscriber as shown.

Similarly, the form seen in FIG. 9 provides a mechanism for establishing voice mail mailboxes and governing special functions performed by each. As seen at 286 in FIG. 6, incoming calls from persons or firms identified in the phone book database may be automatically routed to voice mailboxes designated using the form of FIG. 9. This form allows the subscriber to set a password or pin number (set and reset by pressing the button at 321), to automatically save and/or forward voice mail routed to this mailbox to specific directories or recipients, and to.

The voice mailbox form seen in FIG. 9 further displays a listing of all undeleted voicemail received by this mailbox, along with the date and time recorded and the identification of the caller. By pressing the hypertext link "Review" seen at 333 in FIG. 9, the host services computer sends the HTML page seen in FIG. 10 which displays the voice recognized text of the selected message at 340 and enables the subscriber to control the audio playback of the message using the HTML buttons seen at 342. In addition, the form seen in FIG. 10 enables the subscriber to save the voice mail message as an audio file or send it to as a voice file MIME attachment to email. Similarly, the voice recognized text may be edited by the user using the memo form at 340, and saved or sent as an email attachment.

#### Paging Services

The subscriber may select the hypertext link option 400 seen on the main menu of FIG. 2 to display a form as seen in FIG. 11 to control paging services. The subscriber enters the phone number of his or her paging service (see 85 in FIG. 1) in the input line box at 422. Using the checkboxes and radio buttons provided on the form of FIG. 11, the subscriber may designate the conditions under which auto-

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matic paging is to occur when incoming voice, fax and email messages are received. The form of FIG. 11 also displays a history list of prior automatically generated paging messages for review by the subscriber using the web connection.

#### Voice and DTMF Controls

In order to control the host services computer using nothing but a conventional telephone stationset, such as the telephone 38 or 81 seen in FIG. 1, conventional voice command interpreters and dialtone control mechanisms may be employed. These techniques, now in common use in voicemail systems, may be implemented using voice command interpretation and speech recognition software components available from Pure Speech Corp. One widely used voice controlled telephone systems which has enjoyed considerable success is the Wildfire System offered by Wildfire ???.

In addition to the hardware interface products offered by Dialogic, the Generations TSP system marketed by Voicetek Corp., 19 Alpha Rd., Chelmsford, Mass. provides a telephony server platform that bridges telecommunications and mixed-media information processing networks, linking different communications tools including telephones, computers, faxes, speech recognition and speech synthesis components, and providing services for telephony sequencing, physical interfacing activities and telephony functions.

Speech synthesis programs which may be employed to convert text to speech for replay over the telephone voice connection include: ProVoice (V.2.1)/PrimoVox marketed by First Byte (subsidiary of CUC International, Inc.), 19840 Pioneer Ave. Torrance, Calif. 90503, which enables programmers to add synthesized speech to applications, analyzes and translates text into sound descriptors, phonetic language with pitch, duration and amplitude codes needed to produce stress patterns in phrases and sentences. A second speech synthesis product which may be employed is Vox-Fonts (V.1.0) sold by Voice Information Systems, Inc., 2118 Wilshire Blvd., Ste. 973, Santa Monica, Calif. 90403, which provides a text-to-speech synthesis library of programs that translates ASCII text into digital audio file, supporting Dialogic and other industry standard formats and uses concatenated human speech for natural sound, and allows the user to add translation rules or specify pronunciations for difficult or foreign words.

Software components for handling Fax-To-Voice translation are available from Malibu Software Group, Inc., 23852 Pacific Coast Hwy., Ste. 909, Malibu, Calif., which faxed document to be converted into spoken words. This fax to voice system provides the ability to receive and store fax documents in user's mailbox similar to regular voice mail messages, and incorporates mechanisms for providing security and control of information. Can be integrated with other voice mail systems.

In general, using conventional speech and command recognition, DTMF tone signaling detection, and speech synthesis techniques for sending voice prompts and information to the user, all of the control functions discussed in detail above using the HTML/CGI interface may be replicated using voice controls via the telephone line, permitting the host services computer to be controlled using either the website or the voice interface. Nonetheless, because voice prompts must be presented sequentially and voice response interpretation is similarly cumbersome in many cases, the web interface contemplated by the present invention provides a preferred control mechanism for many functions.

It is to be understood that the embodiment of the invention which has been described is merely illustrative on one

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application of the principles of the invention. Numerous modifications may be made by those skilled in the art without departing from the true spirit and scope of the invention.

#### What is claimed is:

1. The method of processing telephone calls on behalf of a subscriber which comprises, in combination, the steps of: connecting a web browser accessible to said subscriber to the Internet,

connecting a web server to the Internet at a location remote from said web browser,

employing said web browser to submit preference data to said web server via the Internet, said preference data defining the manner in which said subscriber desires to have telephone calls processed,

storing said preference data as submitted in a database, employing call processing apparatus coupled to said database and to the public switched telephone network for receiving incoming telephone calls directed to said subscriber from said public switched telephone network,

employing said call processing apparatus to forward said incoming telephone calls to one or more telephone numbers designated by said preference data via said public switched telephone network, and

selectively recording voice mail messages from persons originating said incoming telephone calls in a manner specified by said preference data.

2. The method set forth in claim 1 wherein the step of selectively recording voice mail messages includes the step of recording voice mail messages from the originators of incoming calls from selected ones of a set of telephone numbers specified by said preference data.

3. The method set forth in claim 1 further including the step of transmitting a listing of said voice mail messages to a remote user from said web server, employing said web server to accept a selection of one of said voice mail messages from said remote user, and thereafter transmitting to said remote user an audio file containing the voice mail message designated by said selection.

4. The method set forth in claim 1 further including the step of employing voice recognition means for translating a selected one of said voice mail messages into a file of text data and for transmitting said file of text data to a destination in a manner specified by said preference data.

5. A The method set forth in claim 4 wherein said file of text data is transmitted in an email message to an email address specified in said preference data.

6. The method set forth in claim 1 wherein at least some of said incoming telephone calls are facsimile transmissions and wherein the step of employing said call processing apparatus to forward said incoming telephone calls includes the step of converting said content into a MIME file attachment transmitted by email to an email address specified by said preference data.

7. The method set forth in claim 1 wherein at least some of said incoming telephone calls are facsimile transmissions and wherein the step of employing said call processing apparatus to forward said incoming telephone calls further includes the steps of establishing a voice mailbox storage system for storing messages recorded by the originators of said incoming calls, employing fax-to-voice means for converting the content of specified ones of said fax messages into voice data, and storing said voice data in said voice mailbox storage system.

8. The method set forth in claim 1 wherein at least some of said incoming telephone calls are facsimile transmissions

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and wherein the step of employing said call processing apparatus to forward said incoming telephone calls further includes the steps of employing character recognition means for converting the content of specified ones of said fax messages into text data and transmitting said text data to a designated destination in a manner designated by said preference data.

9. The method set forth in claim 8 wherein said step of transmitting said text data comprises transmitting said text data in the content of an email message to an email address specified by said preference data.

10. The method set forth in claim 1 further comprising the step of transmitting a paging message to said subscriber upon the receipt of selected incoming calls in a manner specified by said preference data.

11. The method set forth in claim 1 further including the step of establishing a voice connection via the Internet for

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forwarding at least some of said incoming calls to a designated computer in a manner specified by said preference data.

12. The method set forth in claim 11 further including the step of first attempting to forward at least given ones of said incoming calls via an Internet connection to a designated computer accessible to said subscriber and, when said Internet connection is unavailable, forwarding said given ones of said incoming calls via the public switched telephone network to one or more telephone numbers as specified by said preference data.

13. The method set forth in claim 1 wherein said step of forwarding said incoming calls further comprises the step of altering the forwarding destination for said incoming calls at chronological times specified by said preference data.

\* \* \* \* \*

# EXHIBIT 19



US006636587B1

(12) **United States Patent**  
**Nagai et al.**

(10) Patent No.: **US 6,636,587 B1**  
 (45) Date of Patent: **Oct. 21, 2003**

(54) **INFORMATION RECEPTION PROCESSING  
 METHOD AND COMPUTER-TELEPHONY  
 INTEGRATION SYSTEM**

(75) Inventors: Yasuhiko Nagai, Tokyo (JP); Susumu Matsui, Machida (JP)

(73) Assignee: Hitachi, Ltd., Tokyo (JP)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/103,816

(22) Filed: Jun. 24, 1998

(30) Foreign Application Priority Data

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(51) Int. Cl.<sup>7</sup> ..... H04M 11/00

(52) U.S. Cl. .... 379/88.14; 379/87; 379/93.11;  
 379/118; 379/142.14; 379/88.06; 379/88.25

(58) Field of Search ..... 370/352, 356,  
 370/401, 270; 379/88.06, 88.25, 93.11,  
 87, 142.14, 88.13, 88.14, 88.17, 88.18,  
 88.19, 88.22, 88.23, 100.03, 118, 67.1,  
 68

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Primary Examiner—Fan Tsang

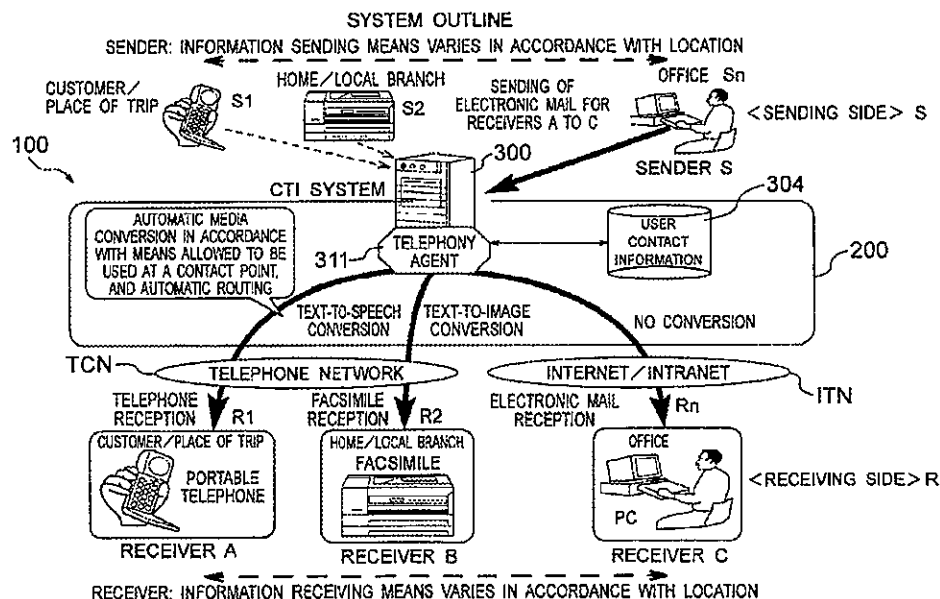
Assistant Examiner—S. P. Singh

(74) Attorney, Agent, or Firm—Antonelli, Terry, Stout & Kraus, LLP

(57) **ABSTRACT**

When a sender sends a transmission message to a receiver by use of a communication appliance such as telephone, portable telephone, facsimile or electronic mail, the transmission message is temporarily received by a computer-telephony integration (CTI) server. The CTI server makes reference to a user contact table to thereby specify a contact point of the receiver at present and the kind of a communication appliance capable of being used by the receiver which are registered in advance in the user contact table. Then, the CTI server sends the transmission message to the receiver after automatic media conversion in accordance with the communication appliance and reception condition which are allowed for the receiver to use. A reception condition requested by the sender may be reflected in a part of the reception condition of the receiver.

20 Claims, 20 Drawing Sheets



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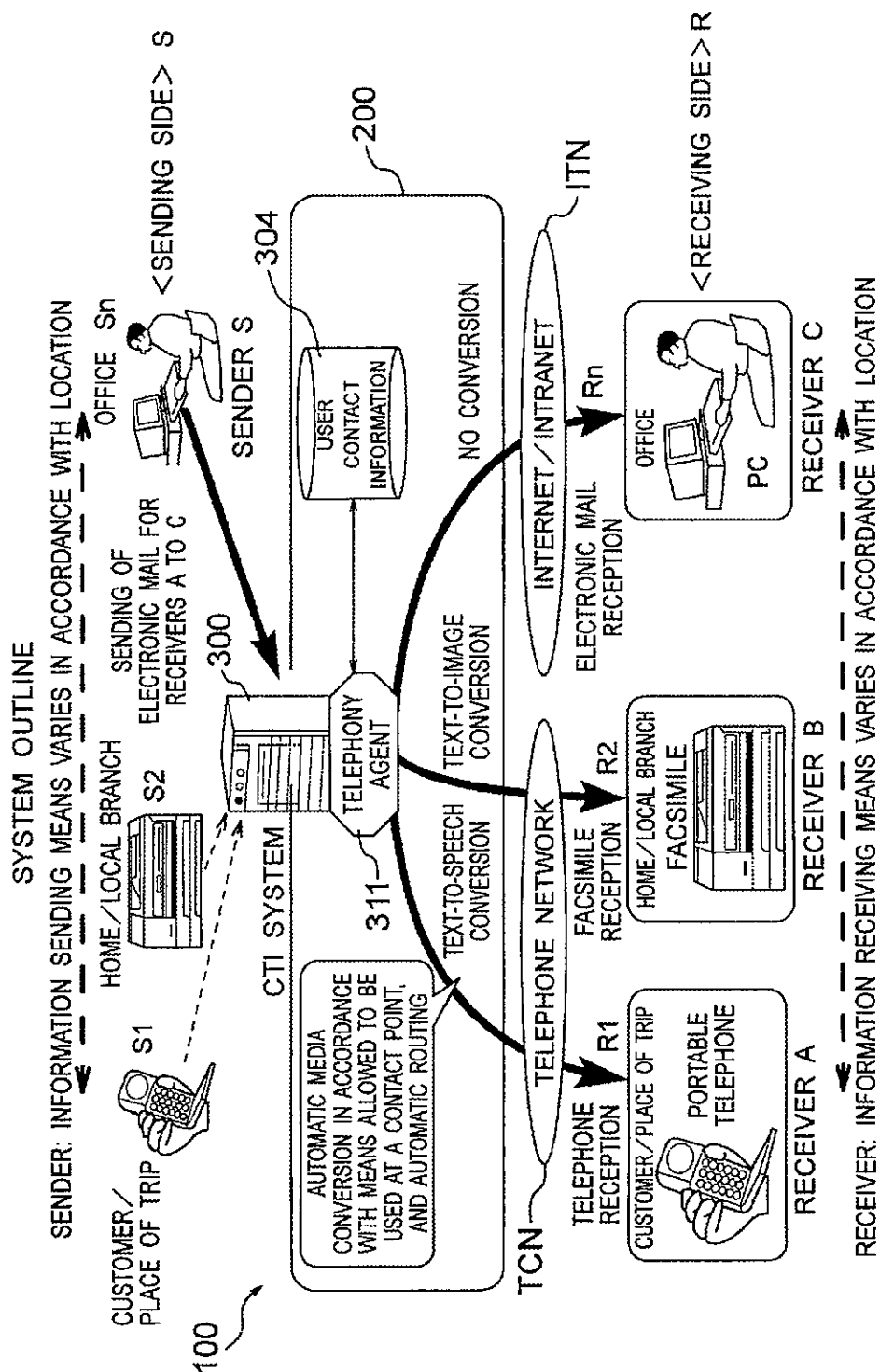
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FIG. 1



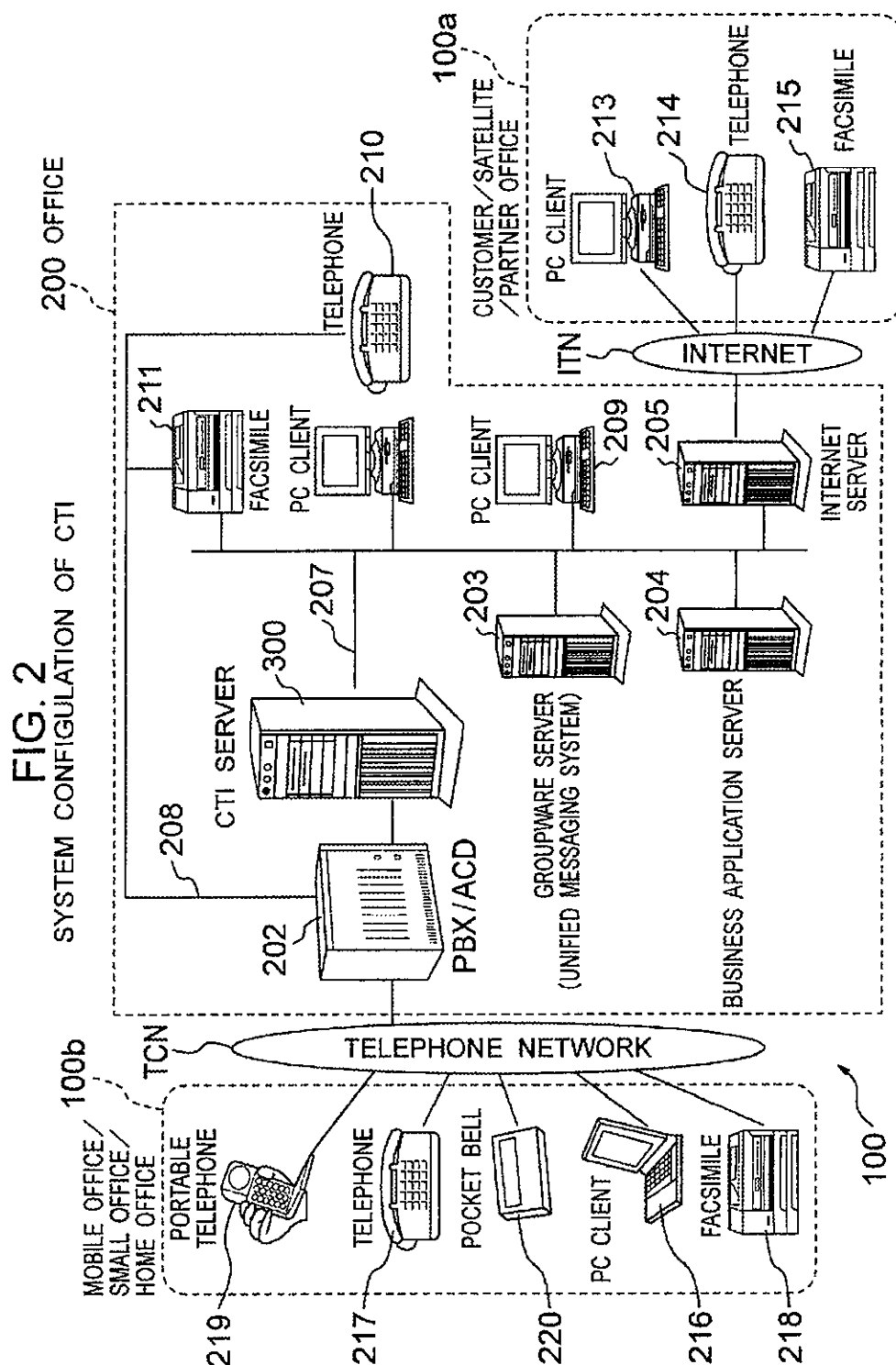
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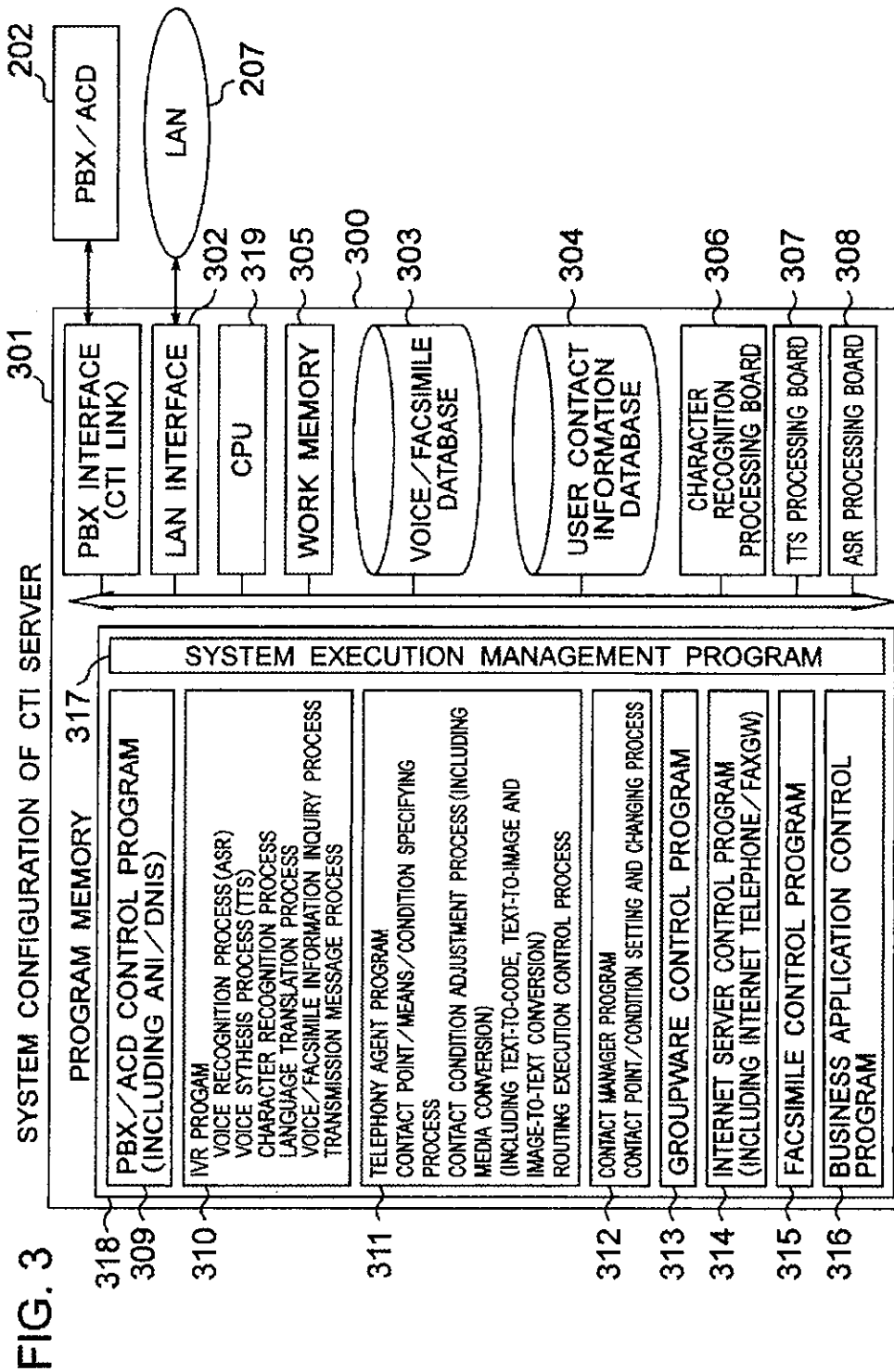
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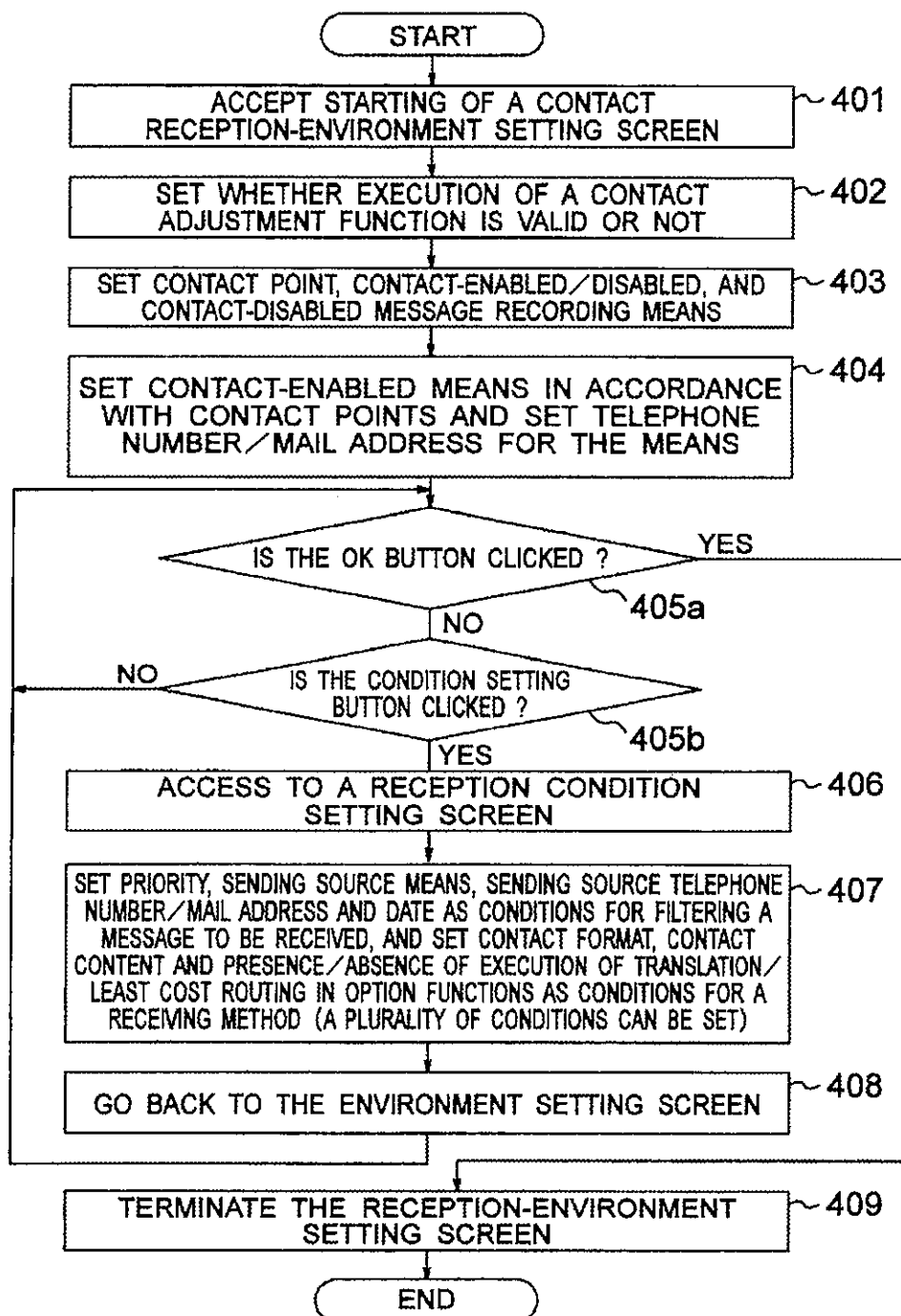
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FIG. 4

OPERATIONAL FLOW OF CONTACT RECEPTION-ENVIRONMENT  
SETTING/CHANGING FROM PC CLIENT



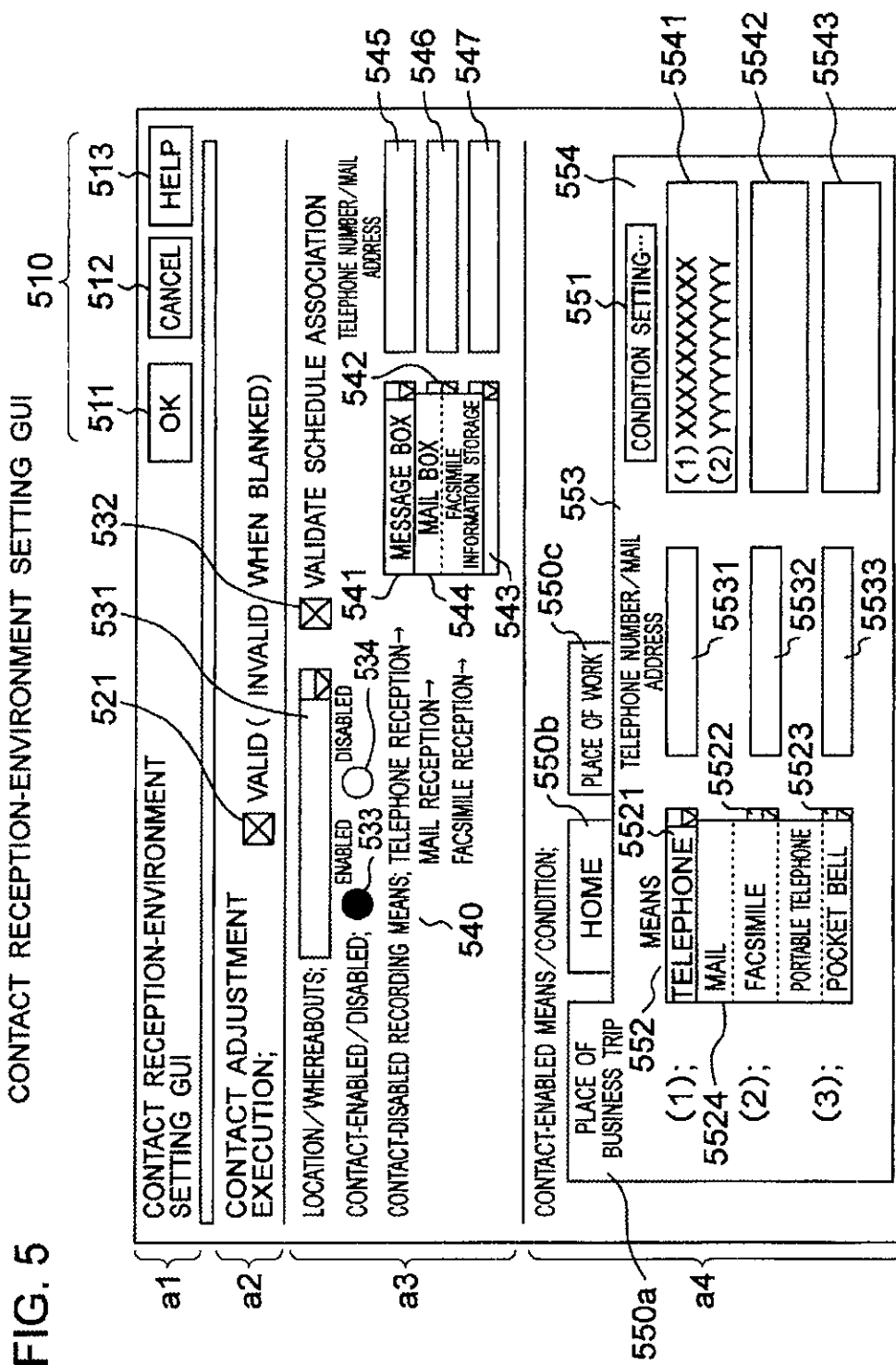
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FIG. 6

RECEPTION CONDITION SETTING GUI

610

611 612 613 614 615

RECEPTION CONDITION SETTING

620

PRIORITY; ☒ ALL 621 ☐ EXPRESS 622 ☐ ORDINARY 623

SENDING SOURCE MEANS; TELEPHONE ☒ 630 MAIL ☐ 640

631

TELEPHONE NUMBER/MAIL ADDRESS: ..... 651

DATE;  650

TIME;  652

660

CONTACT FORMAT; ☒ IMMEDIATE 662 ☐ DELAYED (ARBITRARY) 663 ☐ DELAYED (DESIGNATED TIME) 665

670

CONTACT CONTENT; ☐ ONLY INFORM 671 ☒ ONLY ITEM TITLE/COMMENT 672 ☐ ONLY TEXT 674 ☐ BEST EFFORT 675

OPTION; ☒ VALIDATE TRANSLATION (ENGLISH TO JAPANESE) 681 ☐ VALIDATE LEAST COST ROUTING (LCR) 682

680

SET CONDITION DISPLAY 690

(1) XXXXXXXXXXXX

(2) YYYYYYYYYY

b1 b2 b3

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FIG. 7

USER CONTACT INFORMATION TABLE

7011	7012	702	703	704	705	706	7071	7072	7081	7082	7083
USER NUMBER	NAME	OPENED MAIN TELEPHONE NUMBER	OPENED MAIN MAIL NUMBER	CONTACT ADJUSTMENT STATE	LOCATION/ WHEREABOUTS	CONTACT-ENABLED/ DISABLED	CONTACT-DISABLED RECORDING MEANS	CONTACT-ENABLED MEANS/ CONTACT POINT/ CONDITION			
							MEANS	CONTACT POINT	MEANS	CONTACT POINT	CONDITION
1	A	AA11	A-aaa	VALID	CUSTOMER	ENABLED	MESSAGE BOX	QQ11	PORTABLE TELEPHONE	AA22	XXXXXXXX
2	B	BB11	B-bbb	VALID	HOME	ENABLED	MESSAGE BOX	QQ22	FACSIMILE	BB22	ZZZZZZZ
3	C	CC11	C-ccc	VALID	PLACE OF WORK	ENABLED	MAIL BOX	C-ccc	MAIL	C-ccc	VVVVVVV
.	.	.	.	.	.	.	.	.	.	.	.
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.	.	.	.	.	.	.	.	.	.	.	.
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.	.	.	.	.	.	.	.	.	.	.	.

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FIG. 8

800									
808									
8011	805	8081	8082	8083a	8083b	8083c	8083d	8083e	8083f 8083g
USER NUMBER	NAME	CONTACT- ENABLED MEANS	CONTACT POINT	CONTACT-CONDITION					
				PRIORITY	SENDING SOURCE MEANS	SENDING SOURCE TELEPHONE NUMBER/ ADDRESS	DATE	CONTACT FORMAT	CONTACT CONTENT
				ALL	ALL	ALL	ALL	IMMEDIATE	BEST EFFORT
				ALL	ALL	ALL	ALL	DELAYED	ENTIRE INFORMATION
				EXPRESS	ALL	ALL	ALL	DESIGNATED DELAYED	BEST EFFORT
1	CUSTOMER	PORTABLE TELEPHONE	AA22	ALL	ALL	ALL	ALL	ALL	NONE
	PLACE OF WORK	MAIL	A-aaa	ALL	ALL	ALL	ALL	ALL	NONE
	HOME	FACSIMILE	AA33	EXPRESS	ALL	ALL	ALL	ALL	NONE
2	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:

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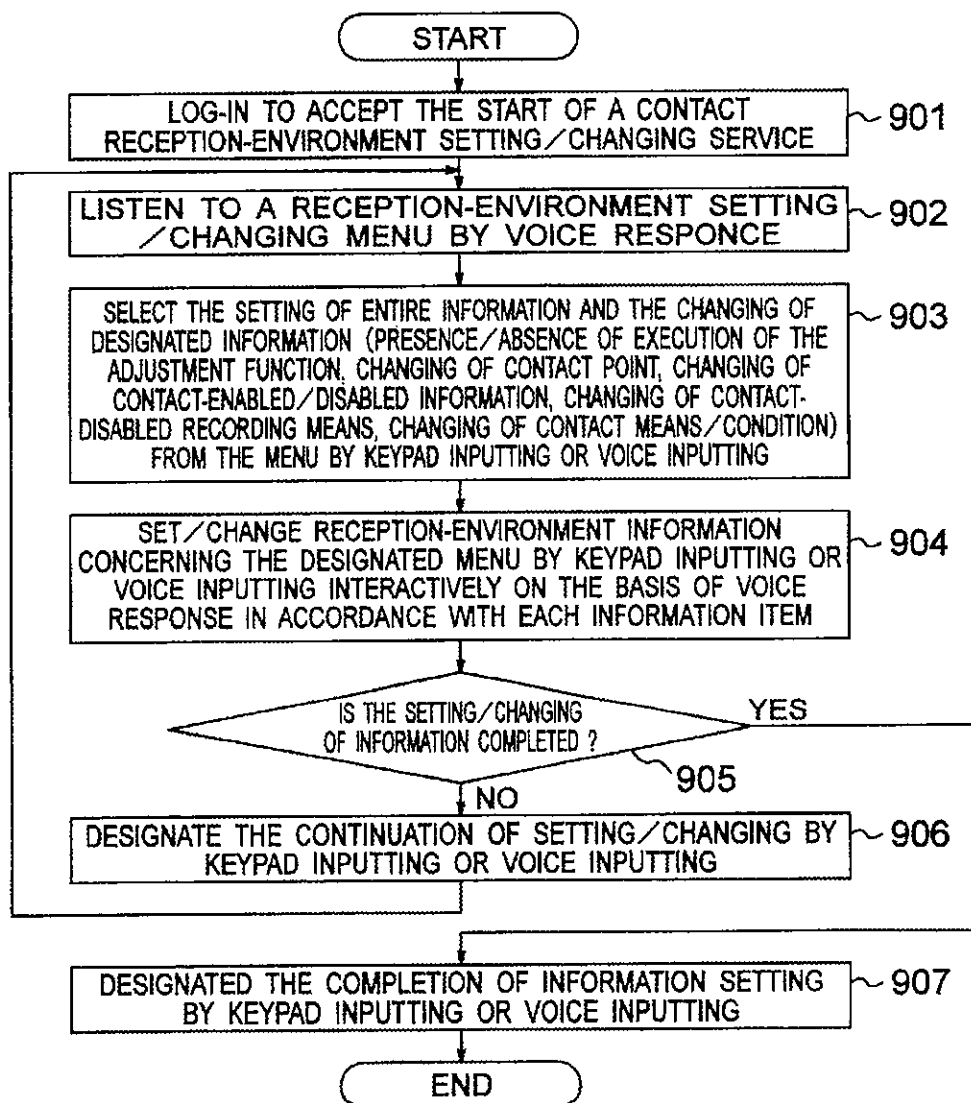
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FIG. 9

OPERATIONAL FLOW OF CONTACT RECEPTION-ENVIRONMENT  
SETTING/CHANGING FROM TELEPHONE/FACSIMILE



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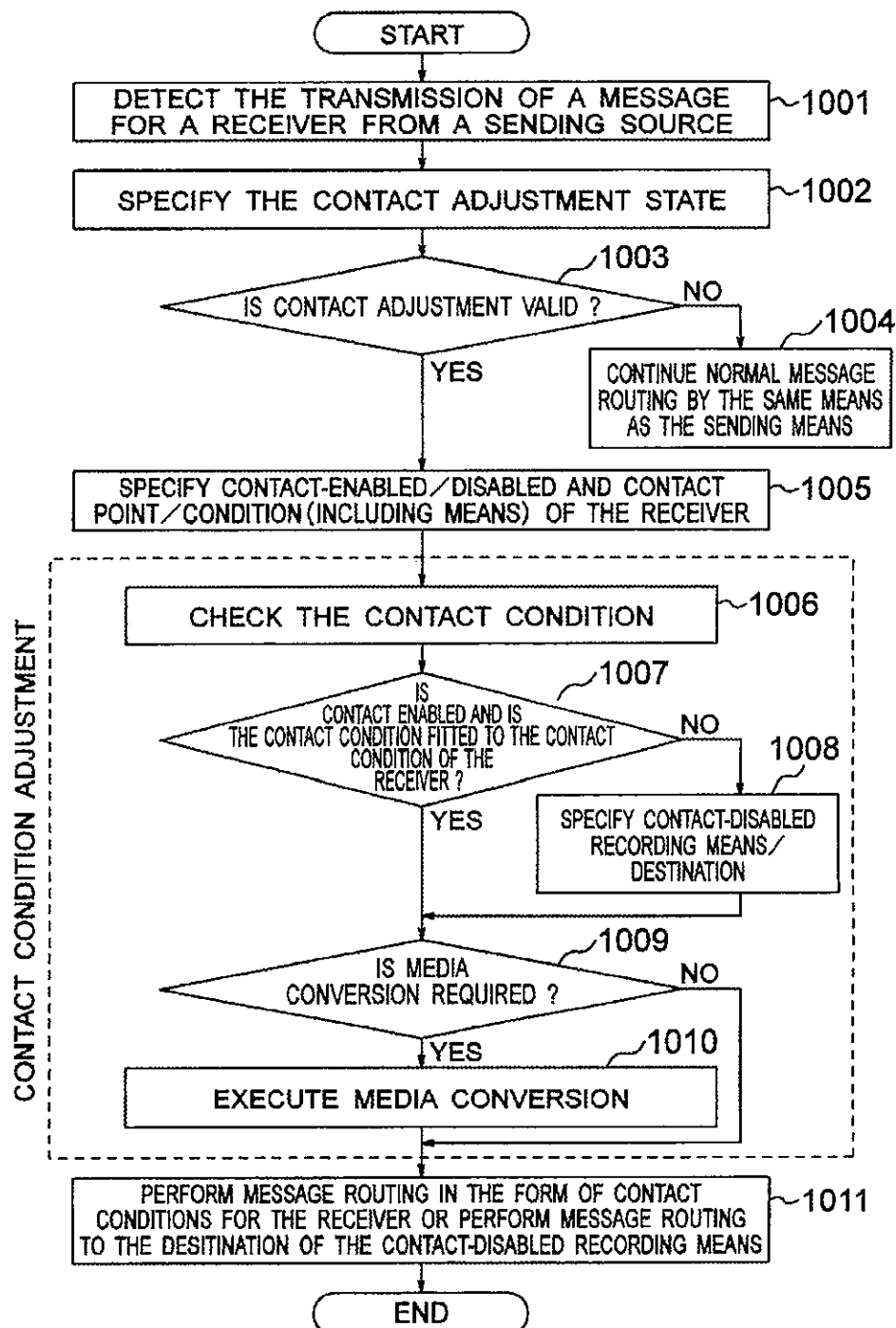
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FIG. 10

OPERATIONAL FLOW OF MESSAGE ROUTING BY CTI SERVER



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FIG. 11

LIMITATION OF TRANSFER CONTENT BASED ON DIFFERENCE IN SENDING / RECEIVING MEANS				
RECEIVING MEANS SENDING MEANS	TELEPHONE / PORTABLE TELEPHONE	MAIL	FACSIMILE	POCKET BELL
MAIL	TELEPHONE / PORTABLE TELEPHONE	E	D	B
	TEXT MAIL	E	D	B
	VOICE MAIL		D	B
	FACSIMILE MAIL		E	B
FACSIMILE	D	E	E	B

LEVEL OF LIMITATION: ONLY INFORM (LEVEL A)  
UP TO ITEM TILE / COMMENT (LEVEL B)  
UP TO TEXT (LEVEL C)  
UP TO BEST EFFORT (LEVEL D)  
UP TO ENTIRE INFORMATION (LEVEL E)

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FIG. 12

CORRESPONDENCE IN CLASSIFICATION OF MEDIA CONVERSION  
IN ACCORDANCE WITH DIFFERENCE IN SENDING/RECEIVING MEANS

RECEIVING MEANS SENDING MEANS	TELEPHONE/ PORTABLE TELEPHONE	MAIL	FACSIMILE	POCKET BELL
MAIL	TELEPHONE/ PORTABLE TELEPHONE	VOICE MAIL	VOICE-TO-IMAGE CONVERSION	VOICE-TO- POCKET BELL CODE CONVERSION
	TEXT MAIL	CONVERSION NOT REQUIRED	TEXT-TO-IMAGE CONVERSION	TEXT-TO- POCKET BELL CODE CONVERSION
	VOICE MAIL		VOICE-TO-IMAGE CONVERSION	VOICE-TO- POCKET BELL CODE CONVERSION
	FACSIMILE MAIL		CONVERSION NOT REQUIRED	IMAGE-TO- POCKET BELL CODE CONVERSION
FACSIMILE	IMAGE-TO-VOICE CONVERSION	FACSIMILE MAIL	CONVERSION NOT REQUIRED	IMAGE-TO- POCKET BELL CODE CONVERSION

ABS00869017

FIG. 13

CORRESPONDENCE IN CLASSIFICATION OF PROCESSING  
IN ACCORDANCE WITH RECEIVING MEANS AND CONTACT FORMAT

CONTACT FORMAT RECEIVING MEANS	IMMEDIATE	DELAYED	DESIGNATED TIME
TELEPHONE/ PORTABLE TELEPHONE	TRANSFER DIRECTLY	NONE	TRANSFER AT A DESIGNATED TIME AFTER STORAGE IN A VOICE DATABASE
MAIL	NONE	TRANSFER DIRECTLY	TRANSFER AT A DESIGNATED TIME FROM A GROUPWARE SERVER
FACSIMILE	TRANSFER DIRECTLY	NONE	TRANSFER AT A DESIGNATED TIME AFTER STORAGE IN A FACSIMILE DATABASE
POCKET BELL	TRANSFER DIRECTLY	NONE	NONE



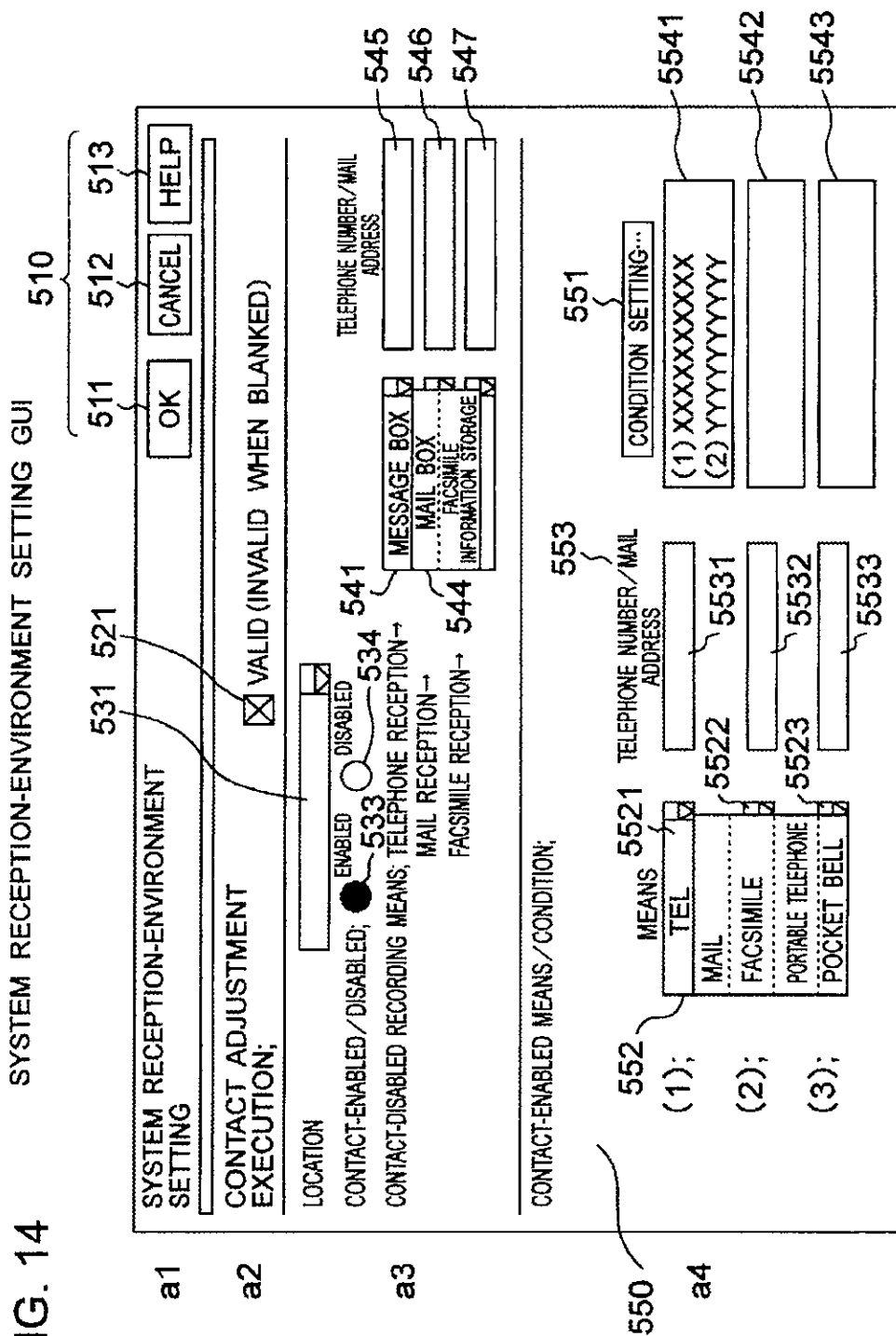
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FIG. 14



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FIG. 15

SYSTEM CONTACT INFORMATION TABLE

700B

7011		7012		702	703	704	705	706	7071		7072	708		
SYSTEM NUMBER	SYSTEM NAME	OPENED MAIN TELEPHONE NUMBER	OPENED MAIN MAIL ADDRESS	CONTACT ADJUSTMENT STATE	LOCATION	CONTACT-ENABLED/DISABLED	CONTACT/DISABLED RECORDING MEANS		CONTACT-ENABLED MEANS/CONTACT POINT/CONDITION		CONTACT-POINT	CONDITION	CONTACT-POINT	CONDITION
							MEANS	CONTACT-POINT	MEANS	CONTACT-POINT				
1	ORDERING/STOCK MANAGEMENT SYSTEM	DD11	D-ddd	VALID	BRANCH OFFICE D	ENABLED	MAIL BOX	PP11	MAIL	D-ddd	XXXXXXX			
2	PURCHASE SYSTEM	EE11	E-eee	VALID	BRANCH OFFICE E	ENABLED	FACSIMILE INFORMATION STORAGE	PP22	FACSIMILE	EE22	ZZZZZZZ			
3	EXAMINATION/APPROVAL WORKFLOW	FF11	F-fff	VALID	BRANCH OFFICE F	ENABLED	MAIL BOX	F-fff	MAIL	F-fff	VVVVVVV			
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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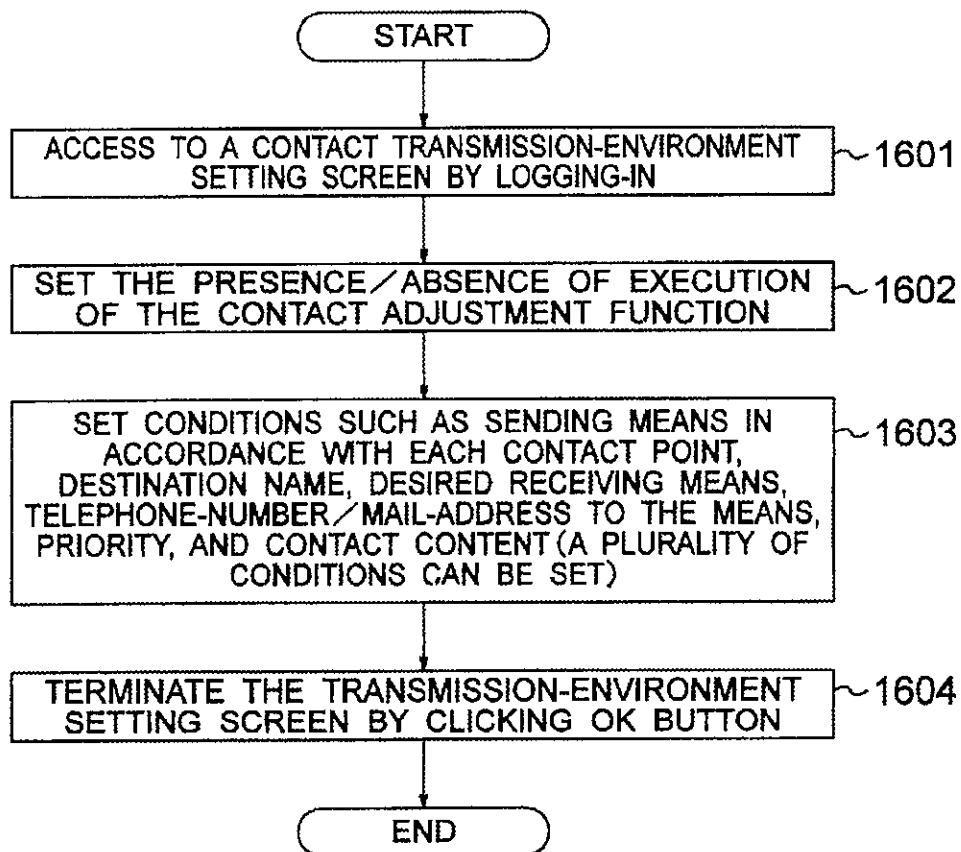
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## FIG. 16

OPERATIONAL FLOW OF CONTACT TRANSMISSION-ENVIRONMENT  
SETTING/CHANGING FROM PC CLIENT



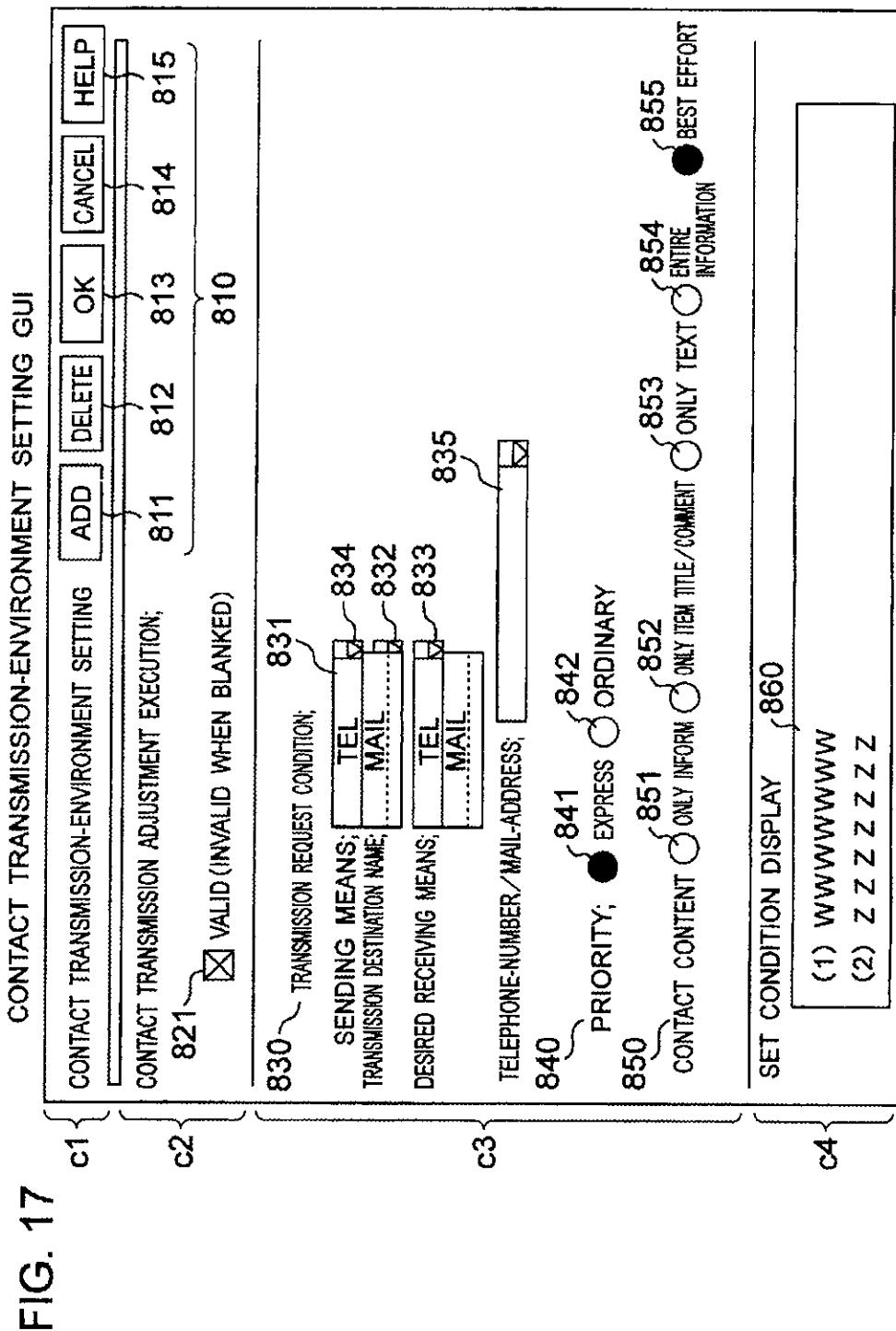
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FIG. 18

USER CONTACT TRANSMISSION CONDITION INFORMATION TABLE

800

805

8011	802	803	804	8051	8052	8053	8054
USER NUMBER	CONTACT-ADJUST-MENT STATE	SENDING MEANS	DESTI-NATION NAME	CONTACT REQUEST CONDITION			CONTACT CONTENT
				DESIRED RECEIVING MEANS	RECEIVING-SIDE TELEPHONE-NUMBER/MAIL-ADDRESS	PRIORITY	
1	VALID	FACSIMILE	RECEIVER A	PORTABLE TELEPHONE	AA22	EXPRESS	BEST EFFORT
		TELEPHONE	RECEIVER B	MAIL	C-ccc	EXPRESS	ENTIRE INFORMATION
		MAIL	RECEIVER C	FACSIMILE	BB22	EXPRESS	BEST EFFORT
		:	:	:	:	:	:
2							
:							
:							

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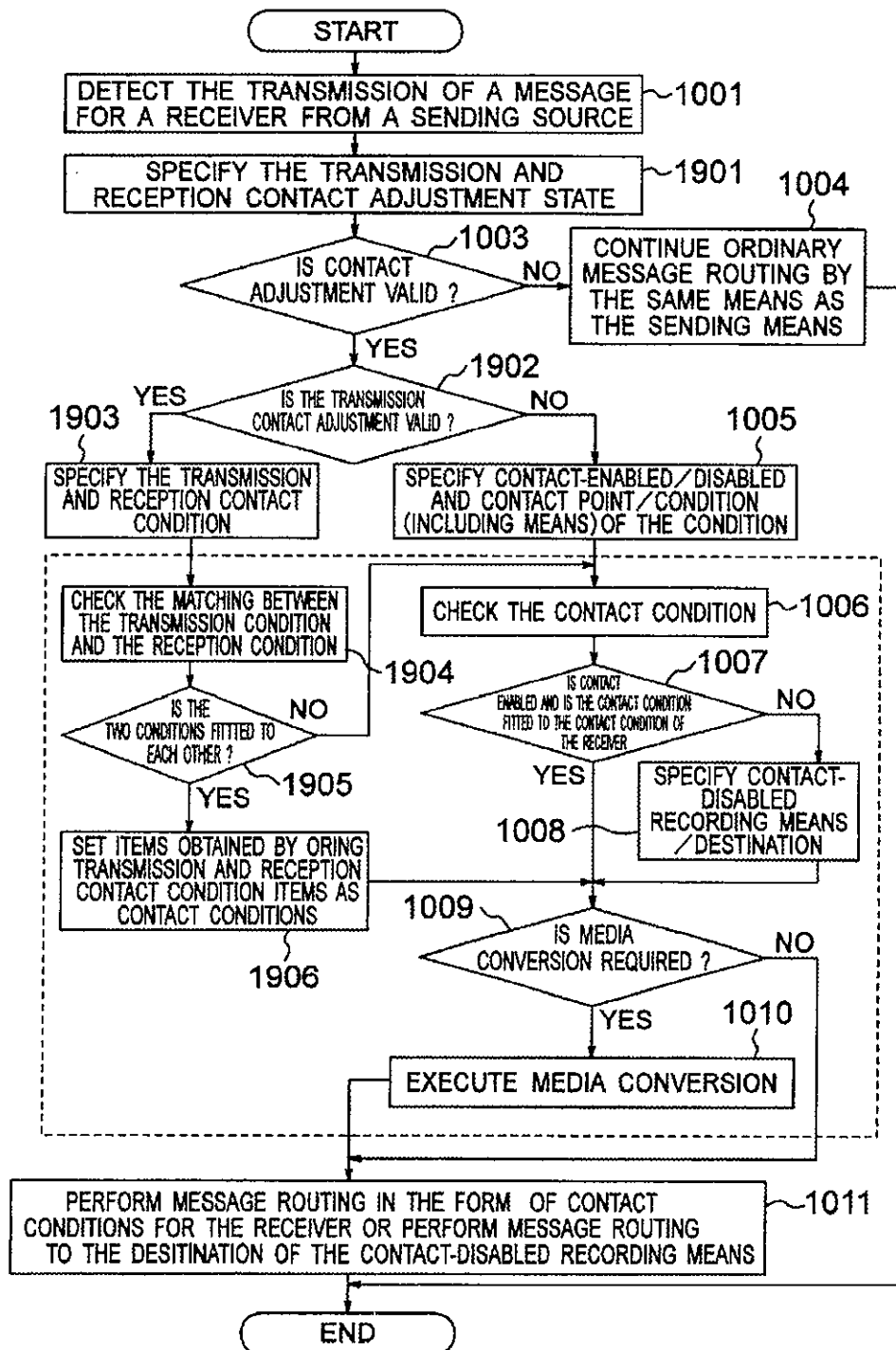
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OPERATIONAL FLOW OF MESSAGE ROUTING WITH SELECTION  
AND DESIGNATION OF TRANSMISSION CONDITION

FIG. 19



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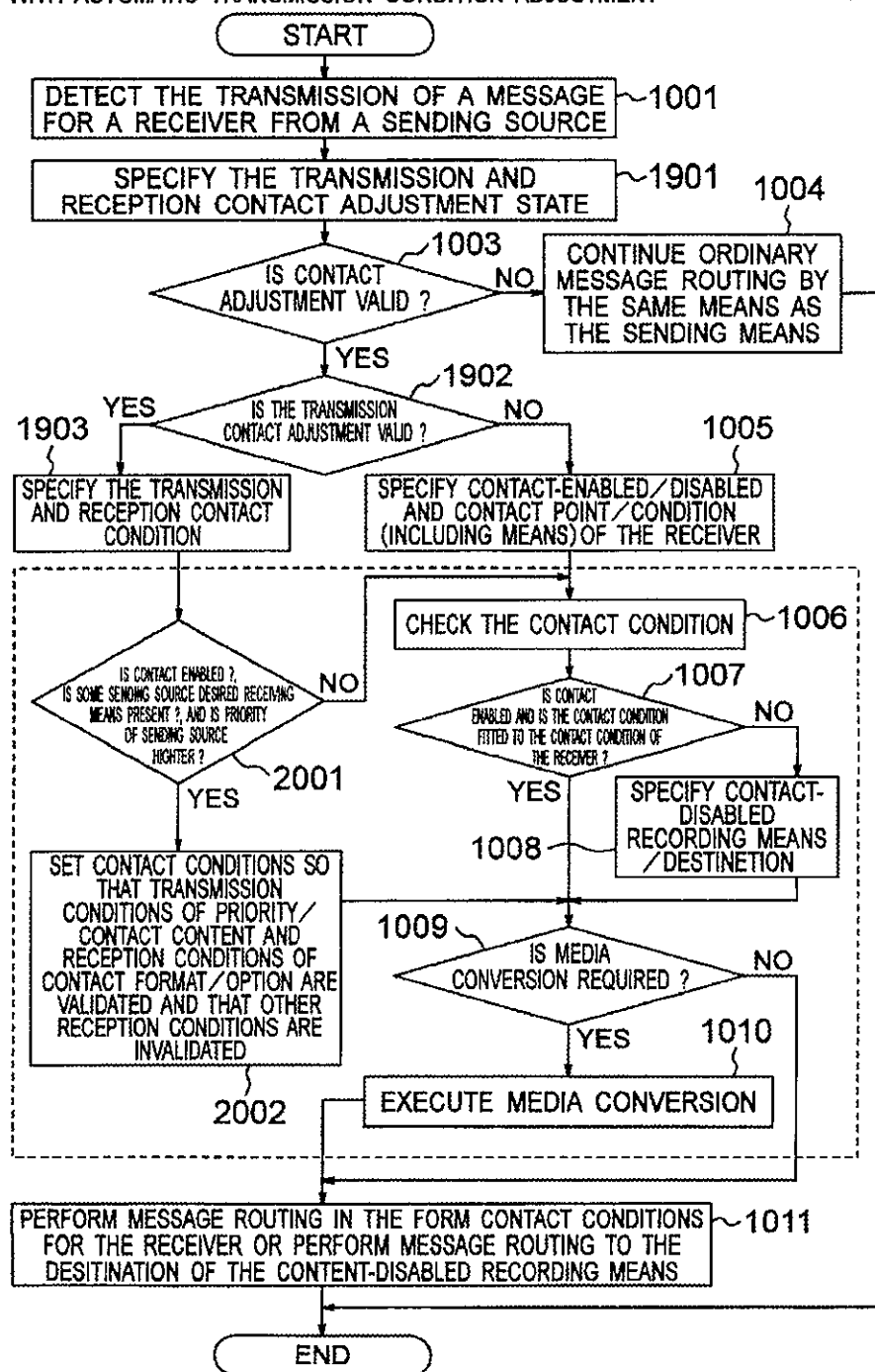
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OPERATIONAL FLOW OF MESSAGE ROUTING  
WITH AUTOMATIC TRANSMISSION CONDITION ADJUSTMENT

FIG. 20



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# INFORMATION RECEPTION PROCESSING METHOD AND COMPUTER-TELEPHONY INTEGRATION SYSTEM

## BACKGROUND OF THE INVENTION

The present invention relates to a computer-telephony integration system (hereinafter referred to as "CTI system") and an information reception processing method to provide an information processing environment for integrating communications with a computer, and particularly relates to a CTI system and an information reception processing method in which information (e.g. multimedia information with voice, text and image) sent from a transmitter side by an arbitrary information transmission means can be automatically converted and transmitted to a connection destination allowed to receive the information by a receiving-side subject in accordance with the reception environment in the connection destination.

In recent years, a CTI system for integrating a telephone with a computer has been demanded under an environment of call center, office, SOHO (Small Office Home Office), virtual enterprise, CALS (Commerce At Light Speed), or the like. Under the aforementioned environment, the CTI system uses multimedia information (e.g. voice, text and image) to construct an effective and efficient communication environment by using a multimodal communication means such as a telephone, a facsimile equipment or a personal computer or to construct an effective and efficient work aiding environment for associating a telephone system with a work system such as a groupware system or a business application by the multimodal communication means. For example, in call center work or office work, such a CTI system has been demanded for integrating computer processing with a conventional telephone system to aid work information with use of the telephone system or for associating one information system with another information system to aid integrated information of a system under an internet/intranet environment and the conventional telephone system to thereby attain improvement in work efficiency and customer's satisfaction.

Incidentally, as a conventional techniques of this type, there is a unified messaging technique in which communication means using various media such as voice, text and image information from various information appliances such as a telephone, facsimile equipment and a personal computer are unified in order to improve communication efficiency in office or SOHO. The technique is described in Workgroup Computer Report Vol. 19, No. 4, 1996, pp.12-17 and U.S. Pat. No. 5,524,137.

As another conventional technique, there is a telephony agent technique in which a person in charge of call center work in the past or a person having skill in call center work is automatically specified as a destination of telephone call by computer processing so that improvement in work efficiency and customer's satisfaction is attained by automatic acceptance/transfer and reduction of human load in a great deal of telephone calls occurring in call center work. The technique is described in Workgroup Computing Report Vol. 19, No. 4, 1996, pp.18-21.

However, the aforementioned conventional techniques merely control a destination of connection but do not control the manner of transmission of information in accordance with the reception environment on the destination of connection. There arises therefore a problem that user's transmission/reception of information can be performed

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only by a transmission/reception means designated on the system in advance and that a user is not allowed to select a contact means freely. As a result, the CTI technique and the unified messaging technique having association with groupware have not achieved any situation in which a user is allowed to have effective use of a communication environment that the user can use various connection means such as a telephone, facsimile equipment and a personal computer and various media such as voice, text and image.

## SUMMARY OF THE INVENTION

An object of the present invention is to provide an information reception processing method and a computer-telephony integration system in which transmission control can be performed in accordance with the information reception environment of a receiving-side subject when multimedia communication information is transmitted from a sending-side subject to the receiving-side subject.

Another object of the present invention is to provide a recording medium on which programs and data to be used in the above-mentioned information reception processing method and computer-telephony integration system are recorded.

In order to achieve the above objects, according to an aspect of the present invention, there is provided an information reception processing method for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, the method comprising the steps of: preliminarily registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of the means allowed to receive information, and reception-condition information for indicating a condition of information reception at the contact point, in accordance with an original destination in each of receiving-side subjects of information reception; and performing contact adjustment by referring to the reception-environment information when information destined for any one of the receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not the arrived information satisfies a reception condition indicated by the reception-condition information of the receiving-side subject, and converting the arrived information so as to satisfy the reception condition when the reception condition is not satisfied and transmitting the converted information to the contact point.

According to another aspect of the present invention, there is provided a computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, the system comprising: a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at the contact point, in accordance with an original destination in each of receiving-side subjects of information reception; and contact adjustment means for performing contact adjustment by referring to the reception-

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environment information when information destined for any one of the receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not the arrived information satisfies a reception condition indicated by the reception-condition information of the receiving-side subject, and converting the arrived information so as to satisfy the reception condition and transmitting the converted information to the contact point.

For example, the aforementioned reception-environment-information registration means may include storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of the system.

Here, preferably, the aforementioned means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out the reception-environment-information setting operation, a function for accepting an input in accordance with the screen, and a function for making the storage means store reception-environment setting data set by the accepted input.

Preferably, the function for displaying a reception-environment-information setting screen displays a screen on which at least contact-enabled-means information and contact-point information can be inputted.

Further, the system may further comprise transmission-environment-information registration means for setting a condition of a request for reception in the information sending side with respect to every original destination in each of the receiving-side subjects.

Here, the transmission-environment-information registration means may include a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of the system.

According to a further aspect of the present invention, there is provided a recording medium for recording a program to be executed by a computer to transmit information from an arbitrary information sending source to a specific receiving-side subject which is a destination of the information transmission, wherein the program is to be executed by the computer in a manner so that the computer performs processing of: preliminarily registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of the means allowed to receive information, and reception-condition information for indicating a condition of information reception at the contact point, in accordance with an original destination in each of receiving-side subjects of information reception; and performing contact adjustment by referring to the reception-environment information when information destined for any one of the receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not the arrived information satisfies a reception condition indicated by the reception-condition information of the receiving-side subject, and converting the arrived information so as to satisfy the reception condition when the reception condition is not satisfied and transmitting the converted information to the contact point.

For example, the reception-environment-information registration may contain a process for storing reception-

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environment information, and a process for accepting a reception-environment-information setting operation from the outside of the system.

The process for accepting a reception-environment-information setting operation may contain a process for displaying a reception-environment-information setting screen to carry out the reception-environment-information setting operation, a process for accepting an input in accordance with the screen, and a process for making the storage means store reception-environment setting data set by the accepted input.

The process for displaying a reception-environment-information setting screen may display a screen on which at least contact-enabled-means information and contact-point information can be inputted.

The function for displaying a reception-environment-information setting screen displays a screen on which information for indicating whether the information can be received on the receiving side or not, and information for indicating a storage means for recording the sent information when reception is disabled, can be further inputted.

The program may further contain a communication means for performing data communication with an information processing apparatus in the outside of the system, and the process for accepting a reception-environment-information setting operation may contain a process for transmitting programs and data to a requester through the communication means to carry out the process for displaying a reception-environment-information setting screen and carry out the function for accepting an input in accordance with the screen when a reception-environment-information setting request is accepted from the outside of the system, and a process for receiving reception-environment setting data sent from the requester through the communication means and delivering the data to the function for making the storage means store information.

According to a still further aspect of the present invention, there is provided a recording medium for recording a program to be executed by a computer for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, wherein the program contains: a program for specifying a sender of telephone or facsimile and sender information and controlling automatic call distribution; a program for controlling interactive voice response (IVR); a groupware program for achieving communication using voice, text and image information between apparatuses connected to a network; a contact manager program for registering and managing reception-environment-condition information containing, at least, contact-enabled-means information, contact-point information and reception-condition information with respect to a reception subject; and a telephony agent program for making reference to the reception-environment information at the time of arrival of information destined for a receiving-side subject to thereby acquire contact-enabled-means information and contact-point information in the receiving-side subject in the destination, judging whether the arrived information satisfies a reception condition indicated by the reception-condition information in the receiving-side subject, and converting the arrived information to satisfy the reception condition when the arrived information does not satisfy the condition.

As a more specific mode of the aforementioned computer-telephony integration system according to the present invention, the following means may be used in combination.

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Means (ANI: Automatic Number Identification/DNIS: Dialed Number Identification Service) for specifying sender and receiver information of telephone or facsimile, means (ACD: Automatic Call Distribution) for distributing call of telephone or facsimile automatically, means (IVR: Interactive Voice Response) for performing automatic response by automatically recognizing voice information, for example, from telephone and converting the voice information into text information or converting text information into voice information for telephone, means for converting image information, for example, from facsimile into image information or converting text information into image information for facsimile, means for sending/receiving text-format electronic mail as a message, means for unified messaging for multimedia electronic mail, desirably, such as voice mail, facsimile mail and text mail, means for registering/managing location/contact-point information for another system newly and additionally associated with the means for registering/managing location/contact-point information for a user's system, means for registering and holding a receiver contact condition containing at least two requisites among the requisites consisting of propriety of contact, contact-enabled means, priority, connection format, used language, contact content, and transfer route only on the receiving side or independently both on the sending side and on the receiving side or selectively from the receiving side condition on the sending side, and a telephony agent means for routing information by specifying a contact point at which a user can receive the information at the time of reception of telephone, facsimile or electronic mail destined for the user, and performing media conversion and condition adjustment automatically on the basis of a contact condition in which the user can receive the information.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an explanatory view showing the outline of a system to indicate the schematic characteristic of the present invention;

FIG. 2 is an explanatory view showing an example of the schematic system configuration of a CTI system according to the present invention;

FIG. 3 is a block diagram showing an example of the system configuration of a CTI server system according to the present invention;

FIG. 4 is a flow chart showing the operation of setting/changing the contact reception environment from the PC client side;

FIG. 5 is an explanatory view showing an example of a scene for the operation of setting/changing the contact reception environment from the PC client side;

FIG. 6 is an explanatory view showing an example of a scene for the operation of setting/changing the reception condition from the PC client side;

FIG. 7 is an explanatory view showing an example of a user contact information table;

FIG. 8 is an explanatory view showing an example of a user location contact condition information table on which contact conditions in each user are classified by location;

FIG. 9 is a flow chart showing the operation of setting/changing the contact reception environment from the telephone/facsimile side;

FIG. 10 is a flow chart showing the operation of routing a message in a CTI server according to the present invention;

FIG. 11 is an explanatory view showing limitation in the content of contact on the basis of a difference in transmission/reception means;

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FIG. 12 is an explanatory view showing correspondence in classification of media conversion on the basis of a difference in transmission/reception means;

FIG. 13 is an explanatory view showing correspondence in classification of processing on the basis of reception means and contact format;

FIG. 14 is an explanatory view showing an example of a scene for the operation of setting/changing the system reception environment;

FIG. 15 is an explanatory view showing a system contact information table;

FIG. 16 is a flow chart showing the operation of setting/changing the contact transmission environment from the PC client side;

FIG. 17 is an explanatory view showing an example of a scene for the operation of setting/changing the contact transmission environment from the PC client side;

FIG. 18 is an explanatory view showing a user contact transmission condition information table on which contact transmission conditions are classified by user;

FIG. 19 is a flow chart showing the operation of routing a message in the case where the transmission condition selection is designated; and

FIG. 20 is a flow chart showing the operation of routing a message in the case where the transmission condition is controlled automatically.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the present invention will be described below with reference to the drawings.

Referring now to FIGS. 1 through 3, an embodiment of the present invention will be described.

The schematic characteristic of a CTI system 100 according to the present invention is shown in FIG. 1. The CTI system 100 uses various communication means such as a telephone, a facsimile equipment and a personal computer (PC) to give a user a communication environment in which multimedia information such as voice, text and image is allowed to be exchanged and in which information transmission is hardly limited regardless of difference in information transmission/reception means and regardless of difference in information expression format between the information transmission side and the information reception side. Hence, this CTI system 100 is provided between a subject of information sending side (hereinafter sometimes simply referred to as "sending side") S and a subject of information receiving side (hereinafter simply referred to as "receiving side") R as shown in FIG. 1.

This CTI system 100 routes information from the sending side S to the receiving side R, that is, sets a path for information transmission so that a contact means, for example, Rn, allowed to be used is selected from contact means R1, R2, . . . Rn which are means for information reception on the receiving side R. When the expression format of information on the sending side S is different from the expression format of information on the receiving side R, this CTI system 100 further converts the expression format automatically so that information on the sending side S can be used by the receiving side R. This is for the purpose of eliminating limitation that information cannot be received because there is generally difference in the expression format of information between media when the medium used on the sending side S and the medium used on the receiving side R are different from each other. When there is

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a difference between media corresponding to the two sides, such as a telephone and a facsimile equipment, a telephone and a personal computer, or a facsimile equipment and a personal computer, there is a difference between the expression formats of information used in the corresponding two media, such as voice and image, voice and text, or image and text. When the expression format of information used in one medium is different from the expression format of information used in the other medium as described above, the expression format in one medium is required to be converted into the expression format in the other medium.

For convenience of description, conversion of the expression format of information between different media may be called not only "information expression format conversion" but also "media conversion" in this specification. In this embodiment, media conversion or expression format conversion mainly means the conversion of the expression format of information between different kinds of media. The present invention is, however, not limited thereto. For example, media conversion or expression format conversion may contain the conversion of the expression format of information between media of the same kind. For example, media conversion may contain the conversion of the expression format of information when word processing software programs of different kinds or word processing software of the same kind but different versions are used so that information cannot be transmitted or cannot be read because of difference in the expression format in spite of information transmission media of the same kind.

To perform the aforementioned routing and media conversion and perform registration therefor, this CTI system 100 has a CTI server 300 having a telephony agent program 311, and a contact manager program 312 (see FIG. 3). Further, the CTI server 300 includes a user contact information database 304 used in routing and media conversion as will be described later.

FIG. 2 is a configuration diagram of an embodiment in which the CTI system 100 according to the present invention is applied to an office 200. In the embodiment shown in FIG. 2, the CTI server 300 is connected to various information processing apparatuses in the office 200 through a local area network (LAN) 207 and connected to a telephone switchboard (PBX/ACD) 202 for performing communication with the outside. Further, the CTI server 300 can be connected to external apparatuses through internet ITN. Incidentally, in the embodiment shown in FIG. 2, the CTI server 300 is connected to internet ITN through an internet server 205 which will be described later. Configuration may be made so that the CTI server 300 can be connected directly to internet ITN.

The telephone switchboard (PBX/ACD) 202 is an automatic call distribution telephone switchboard having a function for performing switching control of in-bound call from a telephone network TCN to the CTI server 300 and out-bound call from the CTI server 300 to the telephone network TCN and an automatic call distribution function for distributing call automatically. A telephone 210 and a facsimile equipment 211 as other apparatuses in the office than the CTI server 300 are connected to the telephone switchboard 202 through telephone line 208.

In the office 200 shown in FIG. 2, a groupware server 203 for providing a unified messaging service for unified messaging of voice, text and facsimile mail and a workflow management service of a work process, a business application server 204 for providing a basic work processing service and an internet server 205 for providing an internet

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service such as WWW, internet telephone and facsimile are provided as other apparatuses connected to the LAN 207 than the CTI server 300. The CTI server 300 provides an information processing service using combination of telephone processing and computer processing in association with the server group and the PBX/ACD.

Further, PC clients 209 are provided in the office 200. The PC clients 209 are connected to the server group through the LAN 207 and connected to the PBX/ACD 202 through the telephone line 208 to thereby provide means in which a user in the office sends/receives information.

On the other hand, in the outside of the office 200, respective development of external offices 100a and 100b which are virtual offices such as a customer office, a satellite office, a business partner office, a mobile office (outdoor), a small office (small-scale branch office, store or business office) and a home office (indoor), is assumed. Apparatuses which can be used by a user in the external office 100a are, for example, a PC client 213, a telephone 214 and a facsimile equipment 215 as apparatuses which can serve as means for sending/receiving information through internet ITN. Further, apparatuses which can serve as means in which a user in the external office 100b transmits/receives information through the telephone network TCN are, for example, a PC client 216, a telephone 217, a facsimile equipment 218, a portable telephone 219 and a pocket bell 220. Incidentally, classification into the external offices 100a and 100b is for the sake of convenience and not limited thereto. Further, apparatuses which can be used in the respective external offices 100a and 100b are shown by way of example.

As described above, in the CTI system 100 according to the present invention, not only telephone but also various information transmission means such as internet and LAN are combined with a computer so that information from an arbitrary transmission means can be transmitted to an arbitrary receiving means.

FIG. 3 is a system configuration diagram of the CTI server 300 according to the present invention. The CTI server 300 has a PBX interface 301 for connection to the PBX 202, a LAN interface 302 for connection to the LAN 207 in the office, a voice/facsimile database 303 for storing voice or facsimile information, a user contact information database 304 for storing system user location/contact-point information and contact means and contact condition information, a work memory 305 for temporarily storing necessary information retrieved from the database 304 and serving as a work area for respective program processing, a program memory 318 for storing various programs, and a CPU 319 for performing access control to memory, database and board and executing respective programs.

Further, the CTI server 300 has various boards on which exclusive-use information processing apparatuses are mounted for performing specific processing, for example, actual processing for media conversion. That is, the CTI server 300 has a character recognition processing board 306 for executing character recognition processing at a high speed, a TTS (Text To Speech) processing board 307 for executing voice synthesis processing at a high speed by converting text information into voice information and an ASR processing board 308 for executing ASR (Automatic Speech Recognition) processing at a high speed for converting voice information into text information by voice recognition. These boards 306, 307 and 308 execute various kinds of processing concerning voice and character recognition processing under the control of an IVR (interactive voice

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response) program 310 which will be described later. Incidentally, boards which can be attached to the CTI server 300 according to the present invention are not limited to these boards.

When the load on the CPU 319 is small, configuration may be made so that all or part of the functions to be carried out by these exclusive-use processing boards can be executed by the CPU 319. In this case, a program therefor is added to the program memory 318.

For example, programs stored in the aforementioned program memory 318 are, for example, a PBX/ACD control program 309 containing a sender and receiver information service (ANI/DNIS) of telephone and facsimile for controlling PBX/ACD, an IVR program 310 for voice recognition, voice synthesis, character recognition, language translation, voice and facsimile information collation and massaging, a telephony agent program 311 for routing information by specifying a contact point, a contact means and a contact condition on the receiving side and adjusting the contact condition to convert the expression format of information into an expression format according to the contact means on the receiving side, a contact manager program 312 for setting, changing and collating user contact information, a groupware control program 313 for performing control in association with the groupware server 203 through the LAN 207, an internet server control program 314 containing an internet telephone and facsimile gateway function for performing control in association with the internet server 205, a facsimile control program 315 for controlling facsimile in the office, a business application control program 316 for performing control in association with the business application server 204, and a system execution management program 317 for managing execution of the program group. Incidentally, programs installed in the CTI server 300 according to the present invention are not limited to these programs.

These programs are executed by the CPU 319, by which various functions defined by the programs are achieved. Accordingly, processing is not achieved by the programs per se. In this specification, however, expression concerning the operation of the CPU 319 may be omitted for convenience of description as if various kinds of processing are achieved by the programs per se.

All or part of the aforementioned programs are recorded in a recording medium such as a CD-ROM so that they can be provided to the CTI system 100. Further, all or part of the programs are stored, for example, in a hard disk device not shown. Further, the data structure of data used in the programs, that is, the data structure of data, for example, generated or used in the contact manager program 312 and the telephony agent program 311 may be recorded in the aforementioned recording medium so as to be provided to the CTI system. For example, this type data structure is shown typically in FIGS. 7, 8, 15 and 18 or FIGS. 11, 12 and 13.

As described above, the telephony agent program 311 performs processing for routing information by specifying a contact point, a contact means and a contact condition on the receiving side and adjusting the contact condition to convert the expression format of information into an expression format according to the contact means on the receiving side. Accordingly, the telephony agent program 311 is executed by the CPU 319 to thereby achieve means for acquiring reception-enabled contact-point information in a receiving-side subject by referring the reception-environment information at the time of arrival of information for the receiving-

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side subject, means for converting the arrived information to satisfy the reception condition indicated by the reception-condition information in the receiving-side subject when the arrived information does not satisfy the reception condition, and means for transmitting the converted information to the contact point on the basis of the acquired contact-point information. In specific functioning of these means, other hardware and software resources operate associatively. For example, for execution of media conversion, the aforementioned programs and boards 306, 307 and/or 308 may operate cooperatively. Further, in registration of the reception-environment information, the contact manager program 312, hardware and software resources for communication and an input device operate.

For example, each of the voice/facsimile database 303 and the user contact information database 304 is constituted by a storage device such as a hard disk device. These databases 303 and 304 may be constituted by one and the same storage device.

The database 304 is used as a reception-environment-information registration means for registering reception-environment information containing, at least, contact-point information for indicating a contact point enabled to receive information in each receiving-side subject of information transmission, and reception-condition information for indicating how the contact point receives information. As a specific example, a user contact information table 700A shown in FIG. 7 and a user contact condition information table 800 shown in FIG. 8 are stored.

The user contact information table 700A shown in FIG. 7 contains, at least, contact-point information with respect to each user as a subject of reception. That is, user number 7011 and user name 7012 as a user identifier, opened main telephone number 702 as the number of an opened main telephone, opened main mail address 703, contact adjustment state information 704 for indicating whether adjustment for transmission of information to the receiving side is effective or not, location/whereabouts information 705 for indicating location or whereabouts of each user, contact-enabled/disabled information 706 for indicating whether contact is enabled or not, contact-disabled recording means information 707 for indicating means for recording information to be received when information reception is impossible, and contact format information 708 for indicating the format of contact when contact is enabled, are stored in the user contact information table 700A. Recording means information 7071 for indicating recording means when contact is disabled, and contact-point information 7072 for indicating a contact point of the recording means, are stored in the contact-disabled recording means information 707. Contact means information 7081 for indicating contact-enabled means, contact-point information 7082 for indicating a contact point of the contact-enabled means, and contact condition information 7083 for indicating the condition of contact, are stored in the contact format information 708.

The user location contact condition information table 800 shown in FIG. 8 is a table which defines contact format information classified by location of each user. In this table, contact formats with respect to at least one location can be defined. The contact formats can be registered in advance as will be described later, so that a contact condition registered in advance can be set in the user contact information table 700A shown in FIG. 7 by a simple operation of designating location or whereabouts.

Although FIG. 7 shows the case where the contents registered in the user location contact condition information

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table 800 shown in FIG. 8 are transferred to the user contact information table 700A, the present invention is not limited thereto. For example, a pointer for linking to a record of a location or contact point on the user location contact condition information table 800 shown in FIG. 8 may be stored in the contact format information 708 on the table 700A shown in FIG. 7 so that information per se is not transferred. Alternatively, for example, information stored in the location/whereabouts information 705 shown in FIG. 7 may be used as the aforementioned pointer. In this case, the column of contact format information 708 can be eliminated from the table 700A shown in FIG. 7.

User number 801, location/whereabouts information 805 and contact format information 808 are registered in the user location contact condition information table 800 shown in FIG. 8. The location/whereabouts information 805 can be provided correspondingly to location or whereabouts. The contact format information 808 can be recorded correspondingly to the location/whereabouts information 805. Various contact formats can be set in the contact format information 808 in accordance with the environment of each location or whereabouts.

As described above with respect to the table 700A shown in FIG. 7, contact means information 8081 for indicating contact-enabled means, contact-point information 8082 for indicating a contact point of each contact-enabled means and contact condition information 8083 for indicating the condition of contact are stored as the contact format information.

The contact condition information 8083 contains: priority information 8083a for indicating priority in processing of a transmission message, for example, distinction between express mail and ordinary mail; sender means information 8083b for indicating information sending means on the sending side S; sender telephone number/address information 8083c for indicating the telephone number and/or mail address of the sender; date information 8083d for setting the date of reception of the transmission message; contact format information 8083e for indicating a timelike contact format in transfer of the transmission message, such as for example "immediate", "delayed" or "delayed for a designated time"; contact-content information 8083f for indicating the content of contact showing the degree of the content of information to be contacted (transferred), such as for example "only inform", "only item title or comment", "only text", "entire information" or "best effort"; and option setting information 8083g for setting various options, such as for example "translation effectuation" and "cost-minimized routing effectuation". The "ALL" set on the table of FIG. 8 shows that any condition allowed to be set in the item can be applied. In the example of FIG. 8, option setting information is designated as "None" showing the state in which no option is set.

An example of the operation of the CTI system according to the present invention will be described below with reference to FIGS. 1 through 13. Classifying roughly, the CTI system performs a process of setting or changing contact reception-environment information as a preparatory process and a contact state adjustment process at the time of reception of information. Incidentally, the former process can be carried out by various media such as for example a PC client, a telephone and a facsimile equipment.

FIG. 4 is an operational flow chart of the process of setting or changing contact reception-environment information of a PC client by accepting an operation from the PC client preparatorily so that the CTI system according to the present

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invention executes message routing, that is, information transmission. The process is executed on the basis of the associative operation of the PC client and the internet server 205 and CTI server 300 in the system according to the present invention. In the CTI server 300, the CPU 319 executes the contact manager program 312 to thereby carry out the process. That is, each program is executed by the CPU 319, so that various functions defined by the program operate to execute the process. Hereinafter, such programs per se will be described as a subject of achievement of various processes for convenience of description.

For this process, the contact manager program 312 contains a program and data which are prepared in advance for achieving contact reception-environment setting GUI in the PC client. The program and data are sent to the PC client by the contact manager program 312 in accordance with a request from the PC client. Further, the contact manager program 312 carries out a process for setting the condition of reception as will be described later. The contact manager program 312 contains a program and data which are prepared in advance for achieving GUI therefor.

As such contact reception-environment setting GUI, for example, the shown in FIG. 5 is prepared. The content of the user contact information table 700A shown in FIG. 7 is set by this contact reception-environment setting GUI. Incidentally, the contact format information 708 shown in FIG. 8 is set by the reception condition setting GUI shown in FIG. 6 as will be described later.

Classifying roughly, the GUI shown in FIG. 5 has four areas. This is, an area a1 for indicating the contact reception-environment setting, an area a2 for setting the validity of contact adjustment execution, an area a3 for setting location, contact-enabling/disabling in the location and recording in the contact-disabled state, and an area a4 for setting the contact-enabled condition, are displayed on a setting screen. Regions called "buttons" for performing operations and settings and character/symbol input regions for inputting characters, symbols or codes are arranged in these areas. A function of inputting an instruction concerning an operation defined by each of the button regions is fulfilled when the position of the button region is clicked, for example, by a mouse.

The GUI used in this embodiment is not limited to the example shown in FIG. 5. For example, various kinds of GUI having button regions, character/symbol input regions, etc. can be used and these regions function in the same manner as shown in FIG. 5.

An OK button 511 for instructing the confirmation of the contact reception environment which has been already set, a CANCEL button 512 for instructing the cancellation of the setting and a HELP button 513 for accepting a request to display a guide message for the operation are arranged in the area a1.

A validity instruction input portion 521 for setting whether contact adjustment according to the present invention is to be executed or not, is provided in the area a2. That is, the adjustment is validated when the validity instruction input portion 521 is marked with the symbol "X", and the adjustment is invalidated, that is, an instruction to invalidate the adjustment according to the present invention can be inputted when the validity instruction input portion 521 is blanked. In practice, the validity can be set not by the operation of marking the position with the symbol "X" but by the operation of clicking the position. As a result of the operation, the symbol "X" is displayed and the acceptance of the instruction is displayed. This rule concerning the

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operation and display is not limited to this but applies to other GUI which will be described later.

A location/whereabouts input portion 531, a schedule association validity instruction input portion 532 for inputting whether schedule association is validated or not, enabled/disabled input portions 533 and 534 for inputting contact-enabled/disabled information, and a contact-disabled recording means input portion 540 for inputting recording means when contact is disabled or when the contact condition is not satisfied, are provided in the area a3.

In the location/whereabouts input portion 531, the location of a user on the receiving side can be inputted by character. Though not shown in FIG. 5, locations or whereabouts inputted in the past may be stored so that suitable one can be selected from the stored locations. Alternatively, standard locations or whereabouts may be prepared so that suitable one can be selected from the locations.

When the schedule association validity instruction input portion 532 is marked with the symbol "X", the location or whereabouts is acquired automatically with reference to the schedule information of the user so that the acquired location or whereabouts can be reflected as the location or whereabouts information. When the schedule association validity instruction input portion 532 is blanked, linking to the schedule information can be invalidated. In this case, the input of the designated location or whereabouts is validated. Incidentally, the user schedule information used is managed by the contact manager program 312.

A contact-enabled setting portion 533 and a contact-disabled setting portion 534 are provided in the enabled/disabled input portions 533 and 534. Here, either instruction is validated. Incidentally, when either portion is clicked, the display format is changed so that the acceptance of the instruction is indicated. For example, the acceptance of the instruction is indicated by the dot expression as shown in FIG. 5. Incidentally, the acceptance format of this operation and the display format of the acceptance result apply to other GUI which will be described later.

Input portions 541 to 543 for designating recording means in accordance with telephone reception, mail reception and facsimile reception respectively and input portions 545 to 547 for inputting telephone number, mail address, etc. in accordance with telephone reception, mail reception and facsimile reception respectively are provided in the contact-disabled recording means input portion 540. Designation can be made by inputting characters or symbols directly through a keyboard into any of these input portions or a pull-down menu 544 may be provided so that recording means prepared in advance or designating means inputted in the past are displayed for selection. In FIG. 5, the pull-down menu 544 is opened for inputting in the input portion 541.

Three input regions 550 concerning "place of business trip" 550a, "home" 550b and "place of work" 550c are prepared as windows in the area a4. These input regions are prepared normally in the system because these are typical locations or whereabouts. It is a matter of course that these input regions need not be prepared in advance and may be prepared whenever necessary. By clicking a headline portion in each input region, the region subjected to clicking is displayed in front and inputting is enabled. FIG. 5 shows the case where the "place of business trip" 550a is selected and inputting is enabled. Incidentally, the C/I system according to the present invention is not limited thereto. For example, windows may be prepared so that the locations or whereabouts inputted in the location/whereabouts input portion 531 in the area a3 are used as headlines of the windows.

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Further, when the schedule association is validated, windows may be prepared so that the locations or whereabouts registered in the schedule managed by the contact manager are used as headlines of the windows.

A contact means input portion 552 (5521 to 5523) for setting contact means in accordance with respective locations, a contact point input portion 553 (5531 to 5533) for setting contact points in accordance with respective locations, a condition setting start portion 551 as a region for starting a screen for setting a condition, and a set condition display portion 554 for displaying set conditions, are provided in the area a4. In the example shown in FIG. 5, the contact means input portion 552 has three input regions 5521 to 5523, the contact point input portion 553 has three input regions 5531 to 5533, and the set condition display portion 554 has three input regions 5541 to 5543. Of course, this is only an example and the number of input regions is not limited thereto.

In the contact means input portion 552, a pull-down menu 5524 can be displayed so that, when a target contact means such as telephone is designated, inputting is enabled. FIG. 5 shows a state in which a pull-down menu in the contact means input region 5521 is opened. Such a pull-down menu is provided in each of the contact means input regions 5521 to 5523. Though not shown, the contact point input portion 553 can be configured in the same manner as the contact means input portion 552. Of course, a specific contact means and a specific contact point can be inputted directly in the contact means input portion 552 and the contact point input portion 553.

Incidentally, when this C/I system is installed, for example, in a specific enterprise, contact means and contact points given to a user in the enterprise with respect to the "place of work" 550c may be registered in advance as standard values of this system.

The condition setting start portion 551 is defined as a software key. Accordingly, by clicking this region, a program and data prepared in advance for the contact manager program 312 can be sent to a PC client to achieve condition setting GUI. Specifically, GUI shown in FIG. 6 is sent to a PC client as will be described later. Then, the contact manager program 312 accepts an operation through the GUI and processes the setting of the reception condition.

The set condition display portion 554 is a region for displaying conditions set by the condition setting GUI which will be described later. When a plurality of conditions are set in accordance with the contact means 5521 to 5523, the plurality of conditions can be displayed. In the example shown in FIG. 5, two conditions are displayed in accordance with the contact means (1) and (2). Incidentally, the number of conditions allowed to be displayed is not limited thereto. When all conditions cannot be displayed, conditions not displayed may be displayed by scrolling.

The reception condition setting GUI shown in FIG. 6 is configured so that information received by a contact means selected on the basis of the GUI shown in FIG. 5 is set more finely by a receiver. Dividing roughly, the reception condition setting GUI shown in FIG. 6 has three areas. That is, an area b1 for performing instructions concerning the reception condition setting, an area b2 for performing inputting for reception conditions of the contact, and an area b3 for displaying conditions set in the area b2, are displayed on a setting screen. Regions called "buttons" for performing operations and settings and character/symbol input regions for inputting characters or symbols are arranged in these areas. A function of inputting an instruction concerning a

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procedure defined by each of the buttons is fulfilled when the position of the button region is clicked, for example, by a mouse. The operation through the GUI shown in FIG. 6 is carried out by a receiver to thereby set the content of the table shown in FIG. 8.

The area b1 is an area for performing various instructions concerning reception conditions. An ADD button 611 for performing an add instruction, a DELETE button 612 for performing an instruction to delete the existing setting of a specific reception condition, an OK button 613 for instructing the confirmation of the reception condition which has been already set, a CANCEL button 614 for instructing the cancellation of the setting and a HELP button 615 for accepting a request to display a guide message for the operation are arranged in the area b1.

A priority designation portion 620 for designating the aforementioned priority, a sending means input portion 630 for inputting the designation of a sending means in the sending source, an address input portion 640 for inputting telephone number, mail address, facsimile number, etc., a date input portion 650 for inputting the designation of date, a contact format designation portion 660 for designating the contact format, a contact content designation portion 670 for designating the contact content, and an option input portion 680 for inputting the designation of option items, are arranged in the area b2.

In the priority input portion 620, ALL 621 for accepting all formats, EXPRESS 622 for accepting only reception designated as express mail and ORDINARY 623 for accepting reception designated as ordinary mail can be designated. These designations can be made by clicking the corresponding regions. FIG. 6 shows an example where ALL 621 is designated. Accordingly, the display format of ALL 621 is made different from the other format.

The sending means input portion 630 is provided as a region for performing inputting for designating a sending means specifically. Not only a sending means can be designated by inputting of characters or symbols directly to the input portion 630 but also a selection menu 631 can be provided in the input portion 630 by displaying means prepared in advance or inputted in the past as shown in FIG. 6.

A region for inputting telephone number, mail address, etc. for each means in the sending source is provided in the address input portion 640. Not only characters, symbols and/or codes can be inputted directly to the input portion 640 but also the aforementioned menu (not shown) may be provided in the input portion 640 for selective inputting.

A date input portion 651 for inputting the desired date of reception and a time input portion 652 for inputting the desired time of reception are provided in the date input portion 650.

An input portion for setting the timing of contact is provided in the contact format designation portion 660. The input designating operation and the display of the operating result are the same as the aforementioned contact-enabled/disabled designation input. In FIG. 6, suitable one can be selected from IMMEDIATE 661, DELAYED (arbitrary) 662 for delaying contact for an arbitrary time and DELAYED (designation) 663 for delaying contact for a designated time. Further, input portions 664 and 665 are provided for designating the date and time of contact when DELAYED (designation) is designated.

Incidentally, there is some case where the designation of the contact format in the contact format designation portion 660 is nonsense in terms of the characteristic of reception

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means as shown in FIG. 13 which will be described later. Accordingly, in the GUI program, nonsense choices among all choices in the contact format designation portion 660 are preferably inactivated in the system side in advance with reference to information shown in FIG. 13 when a reception means is designated.

The contact content designation portion 670 is a region for accepting an input for designating the degree of the content to be transmitted. Regions of ONLY INFORM 671, ONLY ITEM TITLE/COMMENT 672, ONLY TEXT 673, ENTIRE INFORMATION 674 and BEST EFFORT 675 for performing conversion as sufficiently as possible are provided in the contact content designation portion 670. Any of those designations is selectively accepted in the corresponding region.

Incidentally, the content of contact in the contact content designation portion 670 is limited in terms of the characteristic of reception means, for example, as shown in FIG. 11 which will be described later, so that there is some case where the designation of the contact content is nonsense. Accordingly, in the GUI program, nonsense choices among all choices in the contact content designation portion 670 are preferably inactivated in the system side in advance with reference to information shown in FIG. 11 so that the nonsense choices cannot be selected by the receiver when a reception means is designated.

TRANSLATION VALIDITY (English to Japanese) 681 for performing designation to validate translation and LEAST COST ROUTING (LCR) 682 for performing designation to validate least cost routing are provided in the option input portion 680. By clicking a process to be designated, the designation is accepted. The accepted process is marked with "X" which shows the acceptance of the designation.

A set condition display portion 690 is arranged in the area b3. The set condition display portion 690 is a region for displaying conditions set as described above. Although FIG. 6 shows the case where two conditions are displayed, the present invention is not limited thereto. The same display content as in FIG. 5 is displayed.

A procedure for setting a contact reception environment by use of the aforementioned GUI will be described below with reference to FIG. 4.

This process is started when a user uses a WWW browser of a PC client to make access to a contact reception environment screen by logging-on. That is, when the aforementioned access from a PC client is made, the contact manager program 312 is started. The program 312 carries out a process for accepting the access as a request to start the setting or changing of contact reception-environment information to thereby make the setting operation in the PC client possible (step 401). That is, when the aforementioned access is made, the CTI server 300 is connected to the internet server 205 through the LAN 207 from the PC client or through the telephone network TCN. The internet server 205 communicates with the contact manager program 312 of the CTI server 300 on the basis of the accessed address. After user certification by password, a program and data for providing the contact reception-environment setting GUI shown in FIG. 5 are loaded into the PC client which is an access source.

Then, the contact manager program 312 accepts the setting or changing operation from the user on the contact reception-environment setting GUI and executes a setting or changing process in accordance with an instruction designated by the operation (steps 402, 403 and 404). That is,

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firstly, the setting for validating or invalidating contact adjustment execution is accepted (step 402). Secondly, the setting of a contact point, the setting of validating schedule association for automatically reflecting whereabouts registered in schedule management in association with the schedule management function of the contact manager, the setting of contact-enabling/disabling, and the setting for storing a message in the case of contact-disabling or in the case of out-of-condition are accepted (step 403). Specifically, in this step, the setting of a recording means for recording information such as a message, or the like, for example, the setting of a message box, a mail box, and a facsimile information storage, and the setting of the contact point of the recording means are accepted. Thirdly, the setting of contact-enabled means in accordance with location such as place of business trip, place of work or home, and the setting of telephone number and/or mail address indicating a contact point for access to each contact-enabled means are made (step 404). Examples of the contact means include a telephone, a facsimile equipment, a mail, a portable telephone, and a pocket bell or pager. Further, a plurality of contact means can be set as information-reception-enabled means from a plurality of means. The setting of the work place is essential in the setting of information indicating a contact point, so that the mail address and telephone number of the work place are automatically set as an opened main mail address and a telephone number.

Then, the contact manager program 312 accepts the setting as to whether setting is terminated in the state already set or whether contact by the set contact means is made under a certain condition (steps 405a and 405b). That is, when the OK button 511 is clicked, the reception-environment setting screen (GUI) is terminated (step 409). On the other hand, when the condition setting button 551 is clicked, the contact manager program 312 sends a program and data to the PC client for providing the reception condition setting GUI shown in FIG. 6. Then, the operation of inputting to the reception condition setting GUI shown in FIG. 6 is accepted (step 406).

In the reception condition setting GUI, the setting of the priority (EXPRESS, ORDINARY, ALL) of the transmission message, sending source means, sender telephone number or mail address, and the date of reception of the transmission message is accepted as a filter condition for the message to be transferred. Further, the contact format (IMMEDIATE, DELAYED, DELAYED for a designated time) in data transfer, the content of contact (only inform, only item title or comment, only text, entire information, and Best Effort), and option designation (validating translation, validating least cost routing) are set and the operation of setting a necessary condition group by clicking the ADD button 611 and the DELETE button 612 is accepted (step 407).

Incidentally, in the setting of the contact format, the display of choices which cannot be selected by the contact means set previously is inactivated. Accordingly, choices in activated display are accepted. When, for example, the contact means is telephone, facsimile or portable telephone, the display of the DELAYED format is inactivated. When, for example, the contact means is mail, the display of the IMMEDIATE format is inactivated. When, for example, the contact means is a pocket bell or pager, both the display of the DELAYED format and the display of the "DELAYED for a designated time" format are inactivated.

When clicking of the OK button 613 is accepted after the condition setting is terminated, the situation of the procedure goes back to the environment setting GUI (step 408). Here, the procedure from the step 405a is repeated. When the OK

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button 511 is clicked, the environment setting is terminated (step 409). The reception environment data set by clicking of the OK button 511 are sent to the CTI server 300 through the internet server 205 and stored, in the form of a user contact information table shown in FIG. 7 and a user location contact condition information table shown in FIG. 8, in the user contact information database 304 by the contact manager program 312.

Setting or changing of the contact reception-environment information from telephone or facsimile will be described below. FIG. 9 is an operational flow chart in the case where contact reception-environment information is set or changed from telephone or facsimile.

When a user makes a dial call from telephone or facsimile to a contact reception-environment setting or changing service, a starting instruction is accepted in response to the dial call (step 901). That is, in the case of a call from the telephone network TCN, the PBX/ACD control program of the PBX 202 and the CTI server 300 informs the system execution management program 317 of the detection of the call. On the other hand, in the case of a call from the internet ITN, the internet server control program 314 of the internet server 205 and the CTI server 300 informs the system execution management program 317 of the detection of the call. The system execution management program 317 informed of the detection of the call starts the contact manager program 312. The contact manager program 312 uses the IVR program 310 to induce logging into the contact reception-environment setting or changing service by password certification on the basis of voice inputting or keypad inputting of telephone or facsimile.

Then, the contact manager program 312 uses the IVR program 310 to convert the reception-environment setting or changing menu preliminarily stored in the voice database 303 into voice to thereby make voice response to a receiver of telephone or facsimile (setting of entire information and changing of designated information) (step 902). That is, speech response is given to the user. The number of the menu given by keypad inputting or voice inputting is received from the user, so that the designation of selection of the menu is accepted (step 903). Further, the contact manager program 312 uses the IVR program 310 so that a guide message registered in the voice database 303 in accordance with each information item of reception-environment information concerning the selected menu is given as voice response to the user. A replay given from the user by keypad inputting or voice inputting in the manner of successive confirmation is accepted. Setting or changing is performed on the basis of the replay from the user (step 904).

After information setting or changing is completed, a question as to whether setting or changing is to be further continued or terminated is given to the user by speech by use of the IVR program 310. A reply to this question is accepted by keypad inputting or voice inputting (steps 905, 906 and 907).

Incidentally, the reception-environment information set by voice inputting in this operation is subjected to voice recognition by the IVR program 310. All the set data are stored integrally in the user contact information database 304 by the contact manager program 312 in the same manner as in the case of setting from the PC client.

Next, the operational flow of a message routing process by the CTI server 300 will be described below with reference to FIG. 10.

First, the CTI server 300 detects transmission from the outside, receives a message given to the receiver from the

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sending source, stores the message in the work memory 305 and informs the system execution management program 317 of the detection of the transmission message (step 1001). In this process, a program corresponding to the sending means in the sending source performs a process of receiving the message and delivers the process to another program. As shown in FIG. 3, in the case of a call from a telephone or a facsimile equipment, the PBX/ACD control program 309 detects the transmission via the PBX/ACD 202 and the PBX interface 301. In the case of internet, the internet server control program 314 detects the transmission via the internet server 205 (see FIG. 2) and the LAN interface 302. Then, the sending means, sender telephone number, sender mail address, receiver telephone number information (ANI/DNIS), receiver mail address, sending date and priority are collected in each of the programs. Further, the electronic mail sent from a PC is detected by the groupware control program 313 via the groupware server 203 and the LAN interface 302. The groupware control program 313 collects the sender mail address, priority, sending date and receiver mail address. These programs store the collected information as transmission message information (the sender telephone number or address; sending means; priority [always handled as EXPRESS in the case of telephone or facsimile]; sending date; receiver telephone number or address) in the work memory 305. Further, the PBX/ACD control program 309, the internet server control program 314 or the groupware control program 313 informs the system execution management program 317 of the detection of the transmission message.

Then, the system execution management program 317 specifies the contact adjustment state of the receiver (step 1002). This specification is achieved as follows. The system execution management program 317 retrieves opened main telephone number 702 or opened main mail address 703 from the user contact information table 700 (see FIG. 7) on the user contact information database 304 on the basis of the receiver telephone number or receiver mail address stored in the work memory 305 and specifies a coincident contact adjustment state 704. Here, a judgment is made as to whether the contact adjustment state is valid or not (step 1003). If the contact adjustment state is valid, the system execution management program 317 starts the telephony agent program 311. On the contrary, if the contact adjustment state is invalid, the system execution management program 317 stops the processing of the message to the destination, deletes information concerning the destination from the work memory 305, and informs the PBX/ACD control program 309, the internet server control program 314 or the groupware control program 313 of the execution of normal routing in the same manner as the sending means (step 1004).

Then, the telephony agent program 311 specifies the contact-enabled/disabled state, contact means, contact point and contact condition of the receiver (step 1005). This specifying operation is achieved as follows. The telephony agent program 311 searches the user contact information table 700A in the same manner as in the specifying operation of the contact adjustment state. Description will be made about the case where, for example, a sender S sends an EXPRESS text mail to receivers A, B and C from a PC as shown in FIG. 1. In this case, the user contact information table 700A is searched by using the mail addresses A-aaa, B-bbb and C-ccc of the receivers A, B and C, so that information is specified as follows.

Receiver A: contact enabled/disabled=enabled, contact means=portable telephone, contact point=AA22, contact

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condition=(priority=ALL, sending means=ALL, sending source telephone number/address=ALL, date=ALL, contact format=IMMEDIATE, contact content=Best Effort, option=None); (shown as "XXXXXXX" in FIG. 7);

Receiver B: contact enabled/disabled=enabled, contact means=facsimile, contact point=BB22, contact condition=(priority=EXPRESS, sending means=ALL, sending source telephone number/address=ALL, date=ALL, contact format=DELAYED, contact content=Best Effort, option=None); (shown as "ZZZZZZ" in FIG. 7); and

Receiver C: contact enabled/disabled=enabled, contact means=mail, contact point=C-ccc, contact condition=(priority=ALL, sending means=ALL, sending source telephone number/address=ALL, date=ALL, contact format=DELAYED, contact content=Entire Information, option=None); (shown as "VVVVVV" in FIG. 7).

Then, the telephony agent program 311 checks whether the transmission message information on the work memory 305 satisfies the contact condition such as priority, sending means, sending source telephone number or address, date, and contact content or not (step 1006). The term "check of the contact content" used herein means a check as to whether the contact content is in a range of limitation in accordance with the difference in media between the message sending means and the message receiving means as shown in FIG. 11.

The content of checking shown in FIG. 11 is defined in the telephony agent program 311 or prepared as reference data and stored in the program memory 318. The example shown in FIG. 11 is an example in which telephone or portable telephone, mail (text mail, voice mail or facsimile mail) and facsimile are assumed as sending means whereas telephone or portable telephone, mail, facsimile and pocket bell or pager are assumed as receiving means respectively correspondingly to the above-mentioned sending means. In FIG. 11, levels concerning the limitation are expressed as A, B, C, D and E for convenience of expression. Here, level A can be used only to "inform", level B can be used up to "Item Title or Comment", level C can be used up to "Text", level D can be used up to "Best Effort", and level E can be used up to "Entire Information".

Then, the telephony agent program 311 judges whether contact is enabled or not and whether the contact condition is satisfied or not (step 1007). If it is proved that the contact is enabled and the contact condition is satisfied, the situation of the procedure goes to step 1009. On the other hand, if it is proved that the contact is disabled or the contact condition is not satisfied, the contact-disabled recording means/contact-point information 707 on the user contact information table 700A is specified and the situation of the procedure goes to the next step (step 1008). In the aforementioned example, contact with each of receivers A, B and C is enabled and the contact condition is satisfied because the transmission message information is sender telephone number/address=S-sss, sending means=mail, priority=Express, the date of sending=xxxxx. Accordingly, the situation of the procedure goes to step 1009.

Then, the telephony agent program 311 judges the necessity of media conversion due to the difference between sending means and receiving means and the classification of conversion on the basis of the correspondence in the classification of conversion shown in FIG. 12 both in the case where the contact condition is satisfied and in the case where contact is disabled (step 1009).

The correspondence in the classification of conversion shown in FIG. 12 is defined in the telephony agent program

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311 or prepared as reference data and stored in the program memory 318. The correspondence shown in FIG. 12 is an example in which telephone or portable telephone, mail (text mail, voice mail or facsimile mail) and facsimile are assumed as sending means whereas telephone or portable telephone, mail, facsimile and pocket bell are assumed as receiving means respectively corresponding to the above sending means. In the respective correspondence, conversion into a necessary expression format is designated.

When it is proved that the conversion of the transmission message is required, the telephony agent program 311 executes necessary conversion with reference to the correspondence shown in FIG. 12 (step 1010). Incidentally, the conversion is performed by use of exclusive-use processing boards 306, 307 and 308.

When, for example, it is proved in the step 1009 that the conversion of the expression format for the receiving means is required, the transmission message is loaded to the CTI server 300 from the groupware server 203 in the case where the transmission message is a mail, or from the PBX/ACD 202 or the internet server 205 in the case where the transmission message is a telephone or facsimile call. The IVR program 310 sends the transmission message to corresponding one of the boards such as a character recognition board 306, a TTS (text to speech) processing board 307 and an ASR (speech to text) processing board 308. Further, if the contact condition is satisfied, media conversion is executed in accordance with the designation of the contact content. If contact is disabled, media conversion is executed in accordance with the designation of "Best Effort". Results of the conversion are stored in the work memory 305 (step 1010). If conversion is not required, the situation of the procedure goes to the next step. For example, in the aforementioned case where the transmission message is a text mail, text-to-speech conversion is executed in accordance with "Best Effort" for the receiver A having the receiving means of portable telephone, text-to-image conversion is executed in accordance with "Best Effort" for the receiver B having the receiving means of facsimile, and conversion is not required for the receiver C having mail as the receiving means because the sending means and the receiving means are coincident with each other.

Finally, the telephony agent program 311 routes the message destined for receivers satisfying the contact condition by the classification of processing corresponding to the receiving means and the contact format designation of the contact condition shown in FIG. 13 and executes processing designated on the user contact condition information table 800 shown in FIG. 8 if necessary (step 1011). That is, a process for adding designated processing to the transmission message on the work memory 305, on the groupware server 203, on the PBX/ACD 202 or on the internet server 205 is executed if the message range and option are designated in the contact content designation. Then, the message is routed to the receivers by execution of the automatic call distribution control of the PBX/ACD 202 based on the PBX/ACD program 309, the call routing control based on the internet server control program 314 or the mail routing control of the groupware server 203 based on the groupware control program 313. Examples of the option designation include selection of English-to-Japanese translation and selection of least cost routing (LCR) processing of the PBX function or LCR processing for selecting an internet-using process when transfer can be made through internet telephone/facsimile.

In the aforementioned case, as shown in FIG. 1, a call is sent to the receiving means which is a portable telephone of the receiver A by immediate transfer processing, so that the

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transmission message after text-to-speech conversion is read aloud to the receiver A. A call is sent to the receiving means which is a facsimile equipment of the receiver B by immediate transfer processing, so that the transmission message after text-to-image conversion is outputted. Further, the transmission message is directly transferred to the mail address of the receiving means which is mail means of the receiver C by delayed transfer processing.

Further, the transmission message for a contact-disabled receiver is routed to the destination of the contact-disabled recording means, that is, the transmission message on the work memory 305, on the groupware server 203, on the internet server 205 or on the PBX/ACD 202 is routed by execution of a corresponding program, that is, execution of the automatic call distribution control of the PBX/ACD 202 in accordance with the PBX/ACD program 309, the call routing control in accordance with the internet server control program 314 or the mail routing control of the groupware server 203 in accordance with the groupware control program 313 (step 1011). Incidentally, recording to the message box is achieved by storing the transmission message in the voice/facsimile database 303 in accordance with the IVR program 310, and recording to the facsimile information storage is achieved by storing the transmission message in the voice/facsimile database 303 in accordance with the facsimile control program 315. With respect to these messages, a receiver can make access to the CTI server 300 from telephone, facsimile or PC later so that the receiver can verify the transmission message recorded at the contact-disabled time from the voice/facsimile database 303 in accordance with the IVR program 310.

By the aforementioned configuration and operation, message routing in accordance with the receiving means and contact condition allowed to be used at the contact point can be provided to the user without depending on the message sending means. Accordingly, a multimodal communication environment can be constructed in an office environment in which various offices such as a home office, a mobile office, etc. are connected by a communication network. As a result, the user can make communication by means allowed to be used by himself/herself at the point of time regardless of the location of the user in the office environment. Furthermore, both the relaxation of limitation in the communication means and the degree of freedom in selection of means are given to the user, so that both speediness and efficiency in office work are attained. Further, the existing telephone network environment can be utilized effectively, so that there is no necessity of introducing an integrated system into all the office environment and there is no necessity of providing any means added to the communication means for the user individually. Accordingly, a low-cost total information transfer/information sharing environment can be constructed and developed easily.

Another embodiment of the present invention will be described below with reference to FIGS. 2, 3, 14 and 15. The embodiment in FIGS. 14 and 15 shows, as an example, a system which can be applied not only to human-to-human message routing for human users but also to work system communication such as human-to-work system communication, or work system-to-work system communication.

The system configuration and operation are basically the same as in the embodiment shown in FIGS. 4 through 13, except the operation of setting or changing contact reception-environment information, that is, except that a manager of the work system sets or changes environment information and except that access from the browser of the

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PC client for the setting or changing process is made to a system reception-environment setting screen shown in FIG. 14. That is, in the case of a work system, the location or whereabouts is not changed dynamically in comparison with the reception-environment setting screen in the case where the user is a human being. Accordingly, both the designation of automatic whereabouts-changing in association with the schedule management function of the contact manager program 312 and the setting of contact-enabled means or contact condition in accordance with the location or whereabouts are not required. Further, this applies also to the setting or changing process of the reception environment from telephone or facsimile.

Incidentally, the basic configuration of the system reception-environment setting GUI in FIG. 14 is the same as the GUI shown in FIG. 5 except the aforementioned points of difference, so that the same parts of FIG. 14 as those in FIG. 5 are correspondingly referenced for omission of duplicated description.

In the setting process through the system reception-environment setting GUI shown in FIG. 14, the setting and changing is performed by the system manager as described above, so that the necessity in response to another user's request from the outside in the same manner as in the contact reception-environment setting GUI shown in FIG. 5 is eliminated. Accordingly, the contact manager program 312 of the CTI server 300 sends a program and data for providing the GUI of FIG. 14 to the PC client 209 in response to access from the PC client 209 of the system manager in the LAN 207. As a result, setting can be made in the same manner as in the GUI of FIG. 5. Alternatively, the program and data for providing the GUI of FIG. 14 may be stored in the PC client 209 of the system manager in advance.

The reception environment data thus set are stored, in the form of a system contact information table 700B shown in FIG. 15, in the user contact information database 304. The inputting of information, for example, to an ordering/stock management system or purchase system on the business application server 204 or to an examination/approval workflow system on the groupware server 203 is executed by the groupware control program 313 or the business application control program 316 in the CTI server 300 on the basis of the set information on the table 700B.

The configuration of the system contact information table 700B is basically the same as that of the user contact information table 700A in FIG. 7. Accordingly, the same parts are correspondingly referenced for omission of duplicated description. Incidentally, the difference between the tables 700A and 700B is only a difference in information set therein. For example, user name 7012 is shown on the table 700A whereas system name 7012 is shown on the table 700B. This is because of a difference between subjects of information reception, but the two tables 700A and 700B are quite the same in terms of the information for specifying the subjects of information reception. Accordingly, the two tables A and B may be combined into a single table.

By the aforementioned configuration and operation, reception-environment information in each work system can be also registered in the user contact information database in the same manner as in the case where the user is a human being. Accordingly, message routing in accordance with receiving means can be achieved also in the case where subjects of communication are not only human beings but also information systems.

A further embodiment of the present invention will be described below with reference to FIGS. 2, 3, 7 and 10 and

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FIGS. 16 through 19. This embodiment shows the case where message routing is performed while the sending side selects and sets the contact transmission condition from the contact reception condition of the receiving side so that the contact request condition on the message sending side is also reflected.

The system configuration and operation in this embodiment are basically the same as those in the embodiments shown in FIGS. 4 through 13, except the following point of difference in the operation. That is, a process for setting or changing the contact transmission environment is added to the process for setting or changing the reception environment. For the process for setting or changing the contact transmission environment, the contact manager program 312 prepares a program and data for achieving the contact transmission-environment setting GUI in the PC client. The contact manager program 312 sends the program and data to the PC client in accordance with a request from the PC client.

FIG. 17 shows an example of the contact transmission-environment setting screen through the contact transmission-environment setting GUI. This GUI roughly has four areas. That is, an area c1 for making an instruction concerning the setting of the contact transmission environment, an area c2 for setting the validity of execution of contact adjustment, an area c3 for setting the transmission request condition and an area c4 for displaying set conditions are displayed on a setting screen. Regions called "buttons" for carrying out operations and settings and character/symbol input regions for inputting characters or symbols are arranged in these areas. When the position of each of the button regions is clicked by a mouse, or the like, a function of inputting an instruction concerning an operation defined in the button is exhibited.

The area c1 is an area for carrying out various instructions concerning the transmission condition. An ADD button 811 for making an adding instruction, a DELETE button 812 for making an instruction to delete the existing setting of a specific reception condition, an OK button 813 for making an instruction to confirm the set reception condition, a CANCEL button 814 for making an instruction to cancel the setting and a HELP button 815 for accepting a request to display a guide message concerning the operation are arranged in the area c1.

Contact transmission adjustment execution input regions are provided in the area c2 for performing setting on the transmission-environment setting screen as to whether execution of contact adjustment is valid or not. When each of the input regions is clicked, the input region is marked with the symbol "X" showing an instruction to validate the execution.

A transmission request condition input portion 830 for inputting the designation of the transmission request condition for the sending means in the sending source, a priority designation portion 840 and a contact content designation portion 850 are arranged in the area c3. Regions for inputting sending means 831 classified by contact point, designation name 832, desired receiving means 833 and telephone number or mail address 835 for the means are arranged in the transmission request condition input portion 830. Designation items can be inputted in these regions by a character or a symbol through a keyboard, or the like. Further, designation can be inputted through a menu 834 for displaying designation items prepared as references in advance or items designated in the past and selectively designating one of the items.

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Regions for accepting the designation of either EXPRESS 841 or ORDINARY 842 are provided in the priority designation portion 840. When either region is selected, the display format of the selected region is changed. In FIG. 17, the selected region is painted out with one color.

Regions for accepting inputs for designating the degree of the content to be transmitted are provided in the contact content designation portion 850. That is, regions of "only inform" 851, "only item title or comment" 852, "only text" 853, "entire information" 854 and "Best Effort" 855 are provided in this portion 850. The designation of selection of any one of these regions is accepted.

A set condition display portion 860 for displaying set conditions designated by the aforementioned regions is provided in the area c4.

The designations or settings thus inputted in FIG. 17 are stored in the user contact transmission condition information table 800 shown in FIG. 18. User number 8011 as an identifier for indicating a user, contact adjustment state information 802 for indicating whether adjustment for transmission of information on the receiving side is valid or not, sending means information 803 which is information indicating sending means, destination name information 804 for indicating an destination and contact request condition information 805 for indicating contact request conditions are stored in the table shown in FIG. 18.

Desired receiving means information 8051 for specifying a desired means for receiving information to be transmitted, receiving-side telephone-number/address information 8052 for indicating telephone number or mail address of a receiving side, priority information 8053 for indicating priority, and contact-content information 8054 for indicating the designation of the contact content, are set in the contact request condition information 805. The setting items in these regions are the same as in the case of the table shown in FIG. 7, so that duplicated description will be omitted.

A process for setting or changing the contact transmission-environment information in this embodiment will be described below with reference to FIG. 16. FIG. 16 is an operational flow chart of the process for setting or changing the contact transmission-environment information from the PC client.

First, this process is started when a user makes access to the contact transmission-environment setting screen from a WWW browser of a PC client by logging-on. That is, if the aforementioned access is made from a PC client, the contact manager program 312 is started. The program 312 carries out a process for accepting the access as a request to start the process for setting or changing the contact transmission-environment information so as to make the setting operation in the PC client possible (step 1601). That is, if the aforementioned access is made, the CTI server 300 is connected to the internet server 205 through the LAN 207 or telephone network TCN from the PC client. The internet server 205 communicates with the contact manager program 312 of the CTI server 300 on the basis of the accessed address. After user certification based on password, a program and data for providing the contact transmission-environment setting GUI shown in FIG. 17 are loaded into the PC client of the access source.

Then, the user's setting is accepted on the PC client through the transmission-environment setting screen of the transmission-environment setting GUI as to whether execution of contact adjustment is valid or not (step 1602). Further, the setting of contact transmission request conditions, such as sending means classified by contact

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point, destination name, desired receiving means, telephone number or mail address to the means, priority, and contact content is accepted on the same screen (step 1603). Here, among the setting items for the contact transmission request conditions, only items satisfying the contact reception condition on the receiving side are displayed so as to be activated as selection items. That is, if a sending means and a transmission destination name on the sending side are inputted, information, such as contact adjustment state, contact-enabled/disabled, contact-enabled means, contact point and contact condition, corresponding to the destination name on the user contact information table 700A in the user contact information database 304 is retrieved by the contact manager program 312 in the CTI server 300. When the retrieval result shows the case where the contact adjustment state is invalid or contact is disabled, all setting items except the sending means and the transmission destination name on the sending side are displayed so as to be inactivated. Otherwise, items satisfying the retrieved information such as contact-enabled means, contact point and contact condition are selectively displayed so as to be activated.

If the clicking of the OK button 813 is then accepted, the environment setting of the contact transmission environment is regarded as being completed and the environment setting is terminated (step 1604). The transmission environment data which have been set are stored in the user contact transmission condition information table 800 of the format shown in FIG. 18 in the user contact information database 304 in the same manner as in the case of storage of the reception environment data in the embodiment shown in FIGS. 4 through 13. Further, the operation of setting or changing the transmission environment from telephone or facsimile is the same as in the case of the reception-environment setting in the embodiment shown in FIGS. 4 through 13, except the classification of items to be set and the number of items belonging to the contact transmission-environment information.

The operation of performing message routing process will be described below with reference to FIG. 19. As shown in FIG. 19, the point of difference from FIG. 10 which shows the case of only reception conditions is that a process concerning the adjustment of transmission conditions and reception conditions is added. The added process comprises: a process of specifying the sending-side state in specifying the contact adjustment state (step 1901); a process of judging whether the transmission contact adjustment is valid or not (step 1902); a process of specifying transmission/reception contact conditions (step 1903); a process of checking matching between the transmission conditions and the reception conditions (step 1904); a process of judging the above matching on the basis of the result of the checking process (step 1905); and a process of ORing the transmission contact condition items and the reception contact condition items (step 1906). Incidentally, the steps 1001 to 1011 are equivalent to the corresponding procedures in the flow chart of FIG. 10. Accordingly, the description of the procedures in the above steps will be omitted.

When contact condition adjustment between the sending side and the receiving side is not made by the aforementioned added process because the transmission contact adjustment state is invalid (step 1092), the situation of the procedure goes to step 1005. Further, when contact condition adjustment between the sending side and the receiving side cannot be made in the case where the transmission conditions mismatch with the reception conditions at the time of message transmission (step 1905) because the reception conditions are changed on the receiving side after the

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sender sets the transmission conditions, the situation of the procedure goes to step 1006 and message routing is executed only in accordance with the reception contact conditions in the embodiment shown in FIGS. 4 through 13. When the transmission contact adjustment state is valid and the transmission and reception conditions match with each other, message routing is executed in accordance with conditions obtained by ORing items designated in the transmission conditions and items not designated in the transmission conditions but designated in the reception conditions.

By the aforementioned configuration and operation, the sending side can designate contact conditions from the contact conditions set by the receiving side. Accordingly, message routing having high reliability in contact can be provided so that a request on the sending side is also reflected while conditions on the receiving side are made as a range of limitation.

A further embodiment of the present invention will be described below with reference to FIGS. 19 and 20. This embodiment shows an example of the case where message routing is executed so that contact reception conditions on the receiving side are automatically adjusted while contact request conditions in the message sending side are reflected in the contact conditions set by the receiving side.

The system configuration and operation are the same as those in the embodiment shown in FIGS. 16 through 19, except the process of sender's setting or changing the contact transmission environment, that is, except that a request can be set freely in a standpoint on the sending side regardless of the range of limitation in the contact reception conditions set by the receiving side, and further except the operation for message routing, that is, further except that checking the matching between the transmission and reception conditions (step 1904), judging the matching (step 1905) and ORing contact condition items on the sending and receiving sides (step 1906) are replaced by judging contact-enabled/disabled, desired reception means and priority (step 2001) and adjusting contact conditions between the sending and receiving sides (step 2002) as shown in FIG. 20.

In the step 2001, a judgment is made as to whether contact is enabled or not. If contact is enabled, a judgment is further made as to whether the desired reception means exists or not. When there is some desired reception means, priority is further judged. That is, when all of the three judgments are cleared, the situation of the procedure goes to the step 2002. When any one of the three judgments cannot be cleared, the situation of the procedure goes to the step 1006.

In adjustment of contact conditions between the sending and receiving sides in the step 2002, when the priority of the transmission condition is higher than the priority of the reception condition, for example, in the case where the sender expects "EXPRESS" as priority but the receiving side selects "ORDINARY" as priority in the reception condition, the priority ("EXPRESS" in the aforementioned example) and contact content in the transmission conditions are employed so that reception conditions except contact format and option designation are invalidated. When the priority of the transmission condition is not higher than the priority of the reception condition, the transmission conditions are invalidated so that processing is executed only in accordance with the reception conditions in the same manner as in the embodiment shown in FIG. 19.

By the aforementioned configuration and operation, when the emergency of a transmission message is high, transmission/reception contact condition adjustment using contact conditions on the sending side can be performed.

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Accordingly, message routing automatically adjusted in accordance with priority can be provided so that request conditions on the sending side are reflected or conditions on the receiving side are reflected in accordance with the priority.

What is claimed is:

1. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said reception-environment-information registration means includes storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of said system,

wherein said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by said accepted input; and

said function for displaying a reception-environment-information setting screen displays a screen on which at least reception-condition information can be inputted, and

wherein said function for displaying a reception-environment-information setting screen displays a screen on which at least one kind of information among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike-connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, language informa-

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tion for indicating whether said information to be transmitted is required to be translated or not, contact-content information for indicating the degree of the contact content of said information to be transmitted, and transfer-route information for designating a transfer route can be inputted.

2. A computer-telephony integration system according to claim 1, wherein:

said system further comprises communication means for performing data communication with an information processing apparatus in the outside of said system; and said means for accepting a reception-environment-information setting operation has a function for transmitting programs and data to a requester through said communication means to carry out said function for displaying a reception-environment-information setting screen and said function for accepting an input in accordance with said screen when a reception-environment-information setting request is accepted from the outside of said system, and further has a function for receiving said reception-environment setting data from said requester through said communication means and delivering said data to said function for making said storage means store information.

3. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said system further comprises transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of receiving-side subjects; and

said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system.

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4. A computer-telephony integration system according to claim 3, wherein said means for accepting a transmission-environment-information setting operation has a function for setting a contact condition of the information sending side selectively from the range of reception-environment information registered by said reception-environment-information registration means.

5. A computer-telephony integration system according to claim 3, wherein:

said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information for indicating a condition requested by the sending side can be inputted.

6. A computer-telephony integration system according to claim 4, wherein:

said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information for indicating a condition requested by the sending side can be inputted.

7. A computer-telephony integration system according to claim 3, wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

8. A computer-telephony integration system according to claim 4, wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

9. A computer-telephony integration system for transmitting information from an arbitrary information sending

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source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said system further comprises a transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;

said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system;

said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;

said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environment-information setting operation has a function for dis-

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playing a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority.

10. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said system further comprises a transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;

said transmission-environment-information registration means includes a storage means for storing

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transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system;

said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;

said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority,

wherein both an appliance used by a human being and a work processing system for performing work processing are said receiving-side subjects.

11. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact

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point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of receiving-side subjects; said transmission-environment-information registration means including a storage means for storing transmission-environment-information, and means for accepting a transmission-environment-information setting operation from the outside of said system,

wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

12. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception

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condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of receiving-side subjects; said transmission-environment-information registration means including a storage means for storing transmission-environment-information, and means for accepting a transmission-environment-information setting operation from the outside of said system,

wherein said means for accepting a transmission-environment-information setting operation has a function for setting a contact condition of the information sending side selectively from the range of reception-environment information registered by said reception-environment-information registration means, and

wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

13. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point;

a transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;

said transmission-environment-information registration means including a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system;

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said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;

said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority.

14. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information

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mation when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point,

said system further comprises a transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;

said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system;

said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;

said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can

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be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority,

wherein both an appliance used by a human being and a work processing system for performing work processing are said receiving-side subjects.

15. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point,

wherein said reception-environment-information registration means includes storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of said system,

wherein said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by said accepted input,

said function for displaying a reception-environment-information setting screen displays a screen on which at least reception-condition information can be inputted,

wherein said function for displaying a reception-environment-information setting screen displays a screen on which at least one kind of information among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a time-like-connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, language information for indicating whether said information to be transmitted is required to be translated or not, contact-content information for indicating the degree of the contact content of said information to be

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transmitted, and transfer-route information for designating a transfer route can be inputted,

wherein said system further comprises a schedule management means for managing a schedule for each reception subject; and

said means for accepting a reception-environment-information setting operation further has a function for setting reception-environment information with respect to said reception subject in cooperation with said schedule management means.

16. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of receiving-side subjects; said transmission-environment-information registration means including a storage means for storing transmission-environment-information, and means for accepting a transmission-environment-information setting operation from the outside of said system,

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

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17. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point; and

transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of receiving-side subjects; said transmission-environment-information registration means including a storage means for storing transmission-environment information, and means for accepting a transmission-environment-information setting operation from the outside of said system,

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said means for accepting a transmission-environment-information setting operation has a function for setting a contact condition of the information sending side selectively from the range of reception-environment information registered by said reception-environment-information registration means, and

wherein, when a transmission-environment-condition information is set, said contact adjustment means judges whether said transmission-environment condition accords with said reception-environment condition so that said contact adjustment means performs contact adjustment on the basis of a condition of ORing said transmission-environment condition and said reception-environment condition when said transmission-environment condition accords with said reception-environment condition and said contact adjustment means performs contact adjustment in accordance with said reception-environment condition when said transmission-environment condition does not accord with said reception-environment condition.

18. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

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a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point;

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

a transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;

said transmission-environment-information registration means including a storage means for storing transmission-environment information, and means for accepting a transmission-environment information setting operation from the outside of said system;

said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;

said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting

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an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority.

19. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a condition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point,

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

said system further comprises a transmission-environment-information registration means for setting an environment condition in the information sending side in accordance with an original destination in each of said receiving-side subjects;

said transmission-environment-information registration means includes a storage means for storing transmission-environment information, and means for accepting a transmission-environment information setting operation from the outside of said system;

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said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by the accepted input;

said function for displaying a reception-environment-information setting screen displays a screen on which, among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a timelike connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, option information concerning said information to be transmitted, contact-content information for indicating the degree of the contact content of said information to be transmitted and transfer-route information for designating a transfer route, at least the priority information and the contact-content information can be inputted as said reception condition;

said means for accepting a transmission-environment-information setting operation has a function for displaying a transmission-environment-information setting screen to carry out said transmission-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store transmission-environment setting data set by the accepted input;

said function for displaying a transmission-environment-information setting screen displays a screen on which at least transmission-request-condition information, priority information for indicating priority in processing of information to be transmitted and contact content information for indicating the degree of the contact content of said information to be transmitted can be inputted as a condition requested by the sending side; and

said contact adjustment means further has a function for comparing priority in the transmission-environment condition with priority in the reception-environment condition when a requested reception subject set in said transmission-environment-condition information can be contacted so that said contact adjustment means performs contact adjustment in accordance with the setting in the transmission-environment condition with respect to both said priority and said contact content when the transmission-environment condition has higher priority,

wherein both an appliance used by a human being and a work processing system for performing work processing are said receiving-side subjects.

20. A computer-telephony integration system for transmitting information from an arbitrary information sending source to a specific receiving-side subject which is a destination of information transmission, said system comprising:

a reception-environment-information registration means for registering reception-environment information including, at least, contact-enabled-means information for indicating means allowed to receive information, contact-point information for designating a contact point of means allowed to receive information, and reception-condition information for indicating a con-

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dition of information reception at said contact point, in accordance with an original destination in each of receiving-side subjects of information reception;

contact adjustment means for performing contact adjustment by referring to said reception-environment information when information destined for any one of said receiving-side subjects arrives to thereby acquire the contact-enabled-means information and contact-point information which can be received at the destined receiving-side subject, making judgment as to whether or not said arrived information satisfies a reception condition indicated by said reception-condition information of said receiving-side subject, and converting said arrived information so as to satisfy said reception condition and transmitting said converted information to said contact point,

said conversion by said contact adjustment means from said arrived information into said converted information including media conversion determined by selecting one from at least conversion from speech to text, conversion from text to speech and conversion from image to speech,

wherein said reception-environment-information registration means includes storage means for storing reception-environment information, and means for accepting a reception-environment-information setting operation from the outside of said system,

wherein said means for accepting a reception-environment-information setting operation has a function for displaying a reception-environment-information setting screen to carry out said reception-environment-information setting operation, a function for accepting an input in accordance with said screen, and a function for making said storage means store reception-environment setting data set by said accepted input,

said function for displaying a reception-environment-information setting screen displays a screen on which at least reception-condition information can be inputted, wherein said function for displaying a reception-environment-information setting screen displays a screen on which at least one kind of information among priority information for indicating priority in processing of information to be transmitted, connection-format information for indicating a time-like connection format of information transmission containing an instruction as to whether said information to be transmitted must be transmitted immediately or not, language information for indicating whether said information to be transmitted is required to be translated or not, contact-content information for indicating the degree of the contact content of said information to be transmitted, and transfer-route information for designating a transfer route can be inputted,

wherein said system further comprises a schedule management means for managing a schedule for each reception subject; and

said means for accepting a reception-environment-information setting operation further has a function for setting reception-environment information with respect to said reception subject in cooperation with said schedule management means.

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